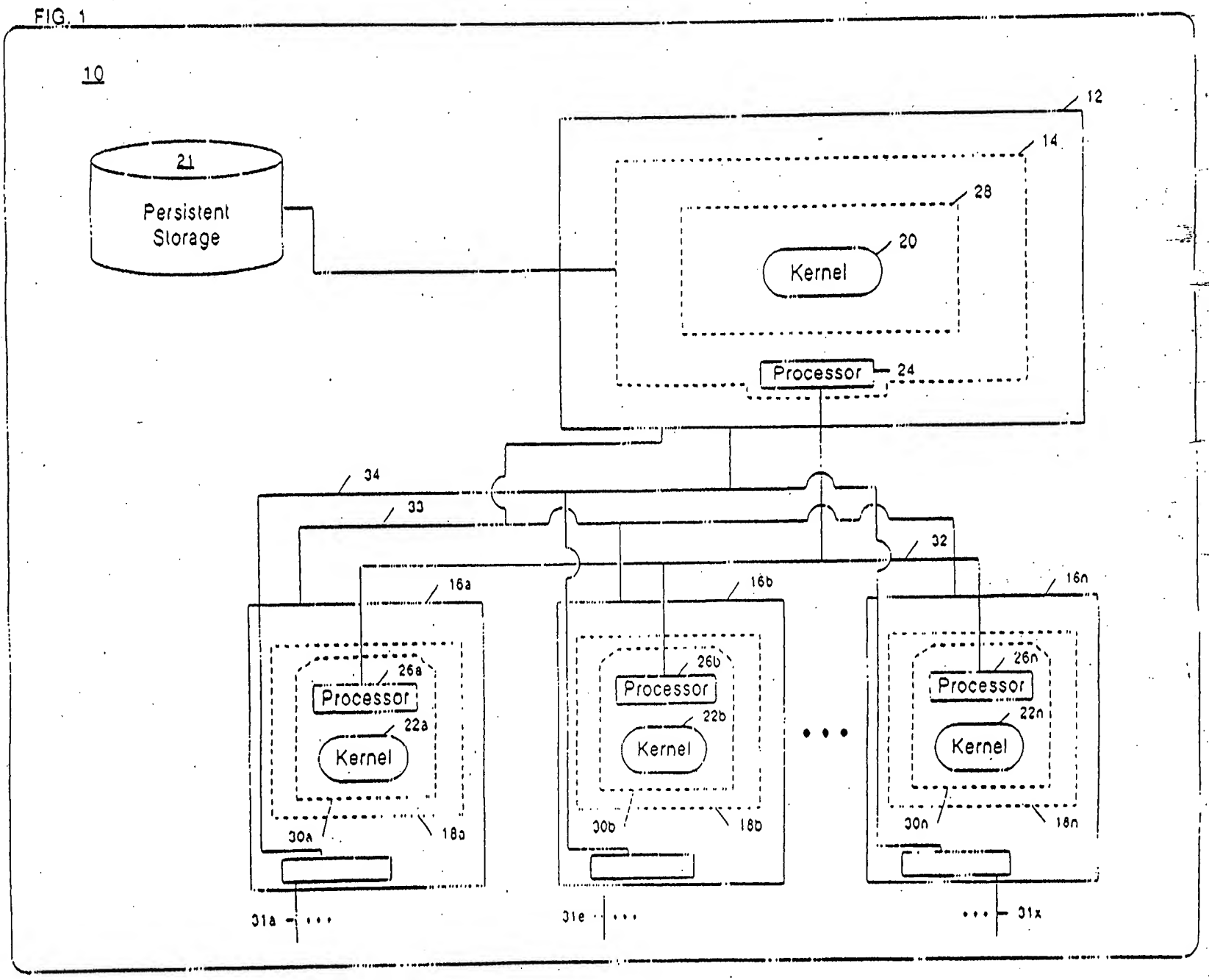
FIG. 1


10
12
14
28
20
Kernel
Processor
24
21
Persistent Storage
34
33
32
16a
16b
16n
26a
Processor
22a
Kernel
30a
18a
26b
Processor
22b
Kernel
30b
18b
26n
Processor
22n
Kernel
30n
18n
31a
31e
31x

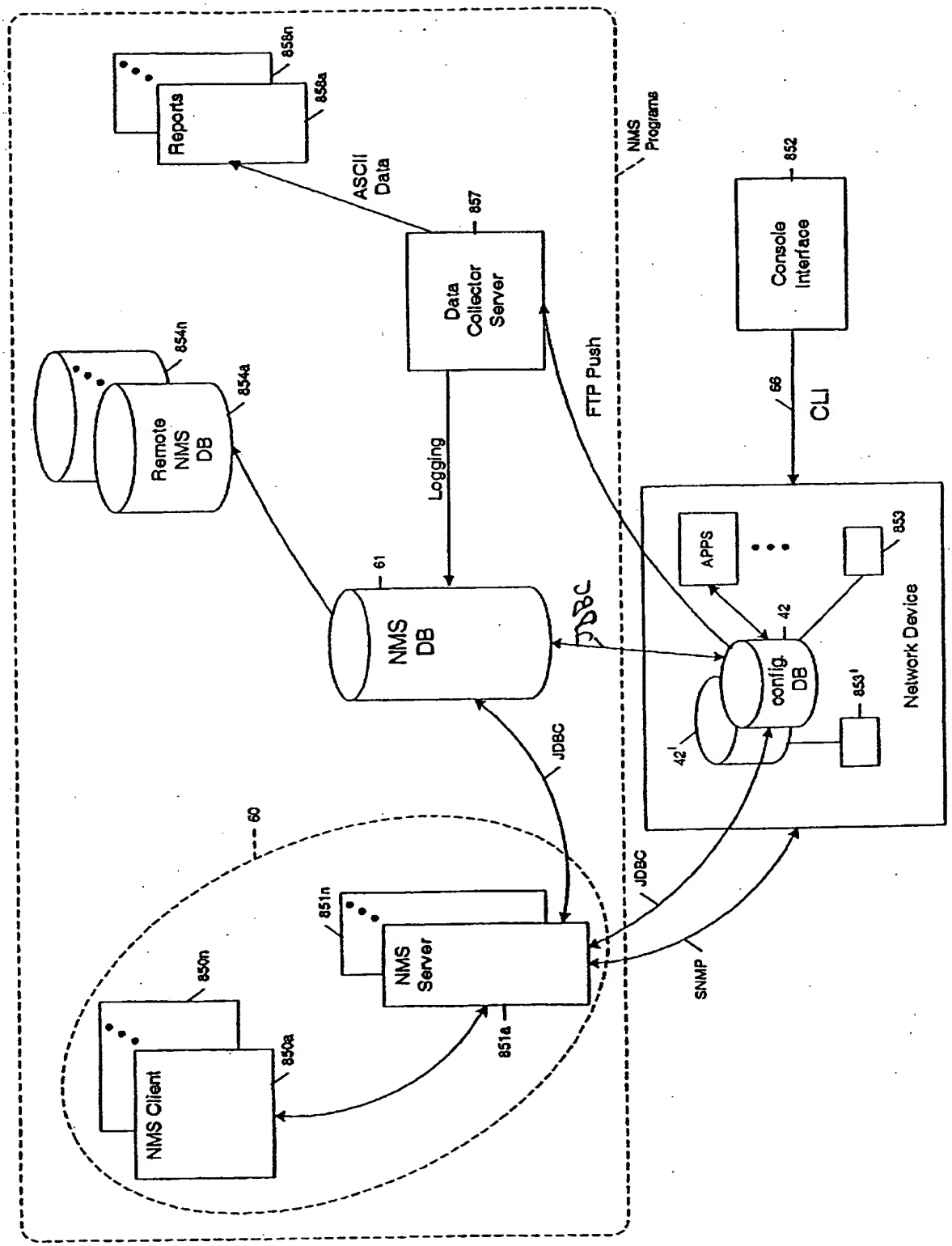

NMS Programs
Reports
858n
858a
ASCII Data
857
Data Collector Server
FTP Push
852
Console Interface
66
CLI
854n
854a
Remote NMS DB
Logging
61
NMS DB
JDBC
APPS
853
42
config DB
853'
42'
Network Device
60
851n
NMS Server
851a
850n
850a
NMS Client
JDBC
SNMP

Fig. 2a

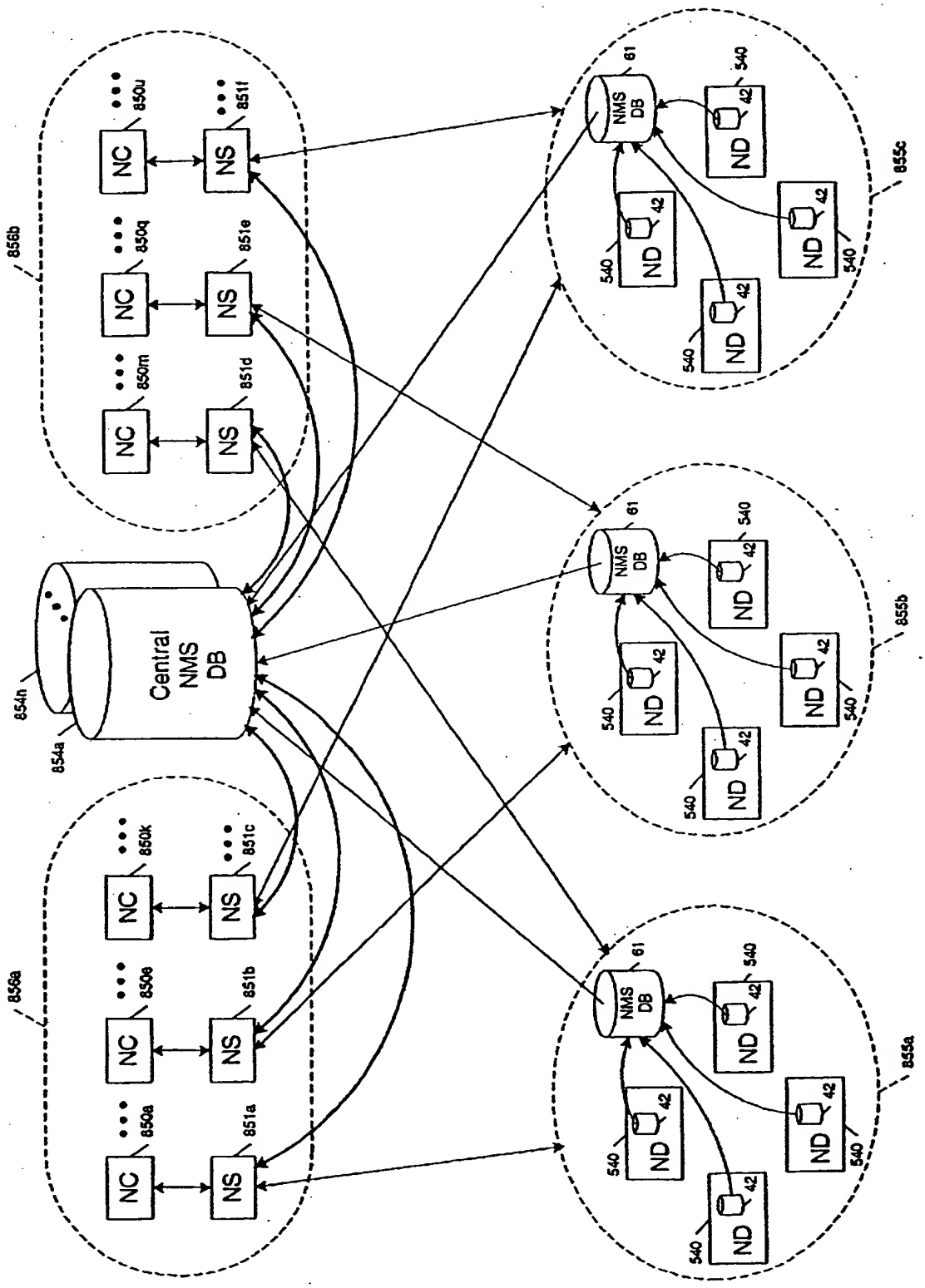

Central NMS DB
854n
854a
856b
856a
NC
NS
850u
851f
850q
851e
850m
851d
850k
851c
850e
851b
850a
851a
855c
855b
855a
NMS DB
61
ND
42
540

Fig. 2b

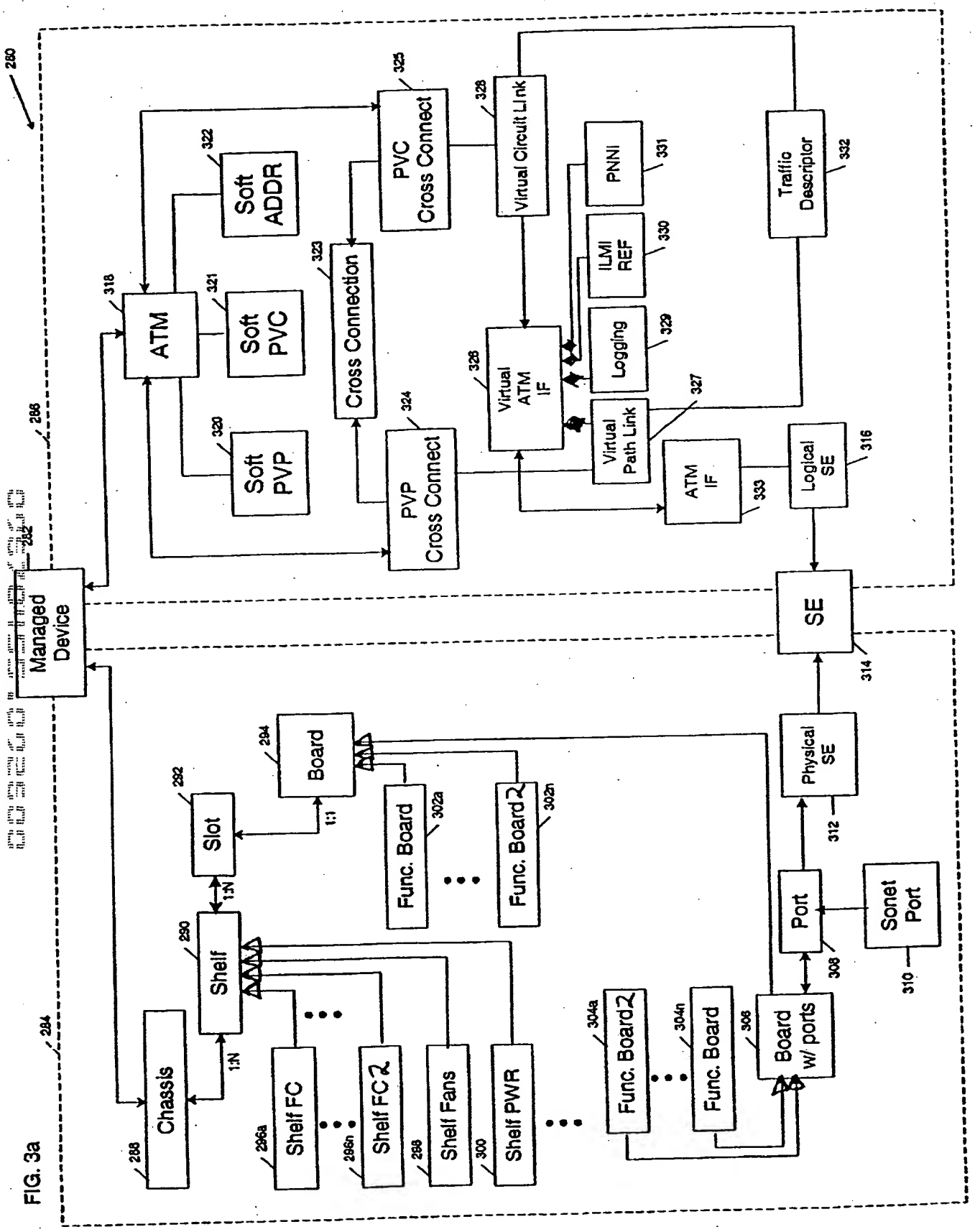

280
PVC Cross Connect
325
Virtual Circuit Link
328
Soft ADDR
322
PNNI
331
Traffic Descriptor
332
ILMI REF
330
Cross Connection
323
ATM
318
Soft PVC
321
Logging
329
Virtual ATM IF
326
Virtual Path Link
327
Soft PVP
320
PVP Cross Connect
324
ATM IF
333
Logical SE
316
286
Managed Device
282
SE
314
Board
284
Physical SE
312
Slot
292
Func. Board
302a
Func. Board2
302n
1:1
1:N
Shelf
290
Port
308
Sonet Port
310
Chassis
288
Shelf FC
296a
Shelf FC2
296n
Shelf Fans
298
Shelf PWR
300
Func. Board2
304a
Func. Board
304n
Board w/ ports
306
284

FIG. 3a

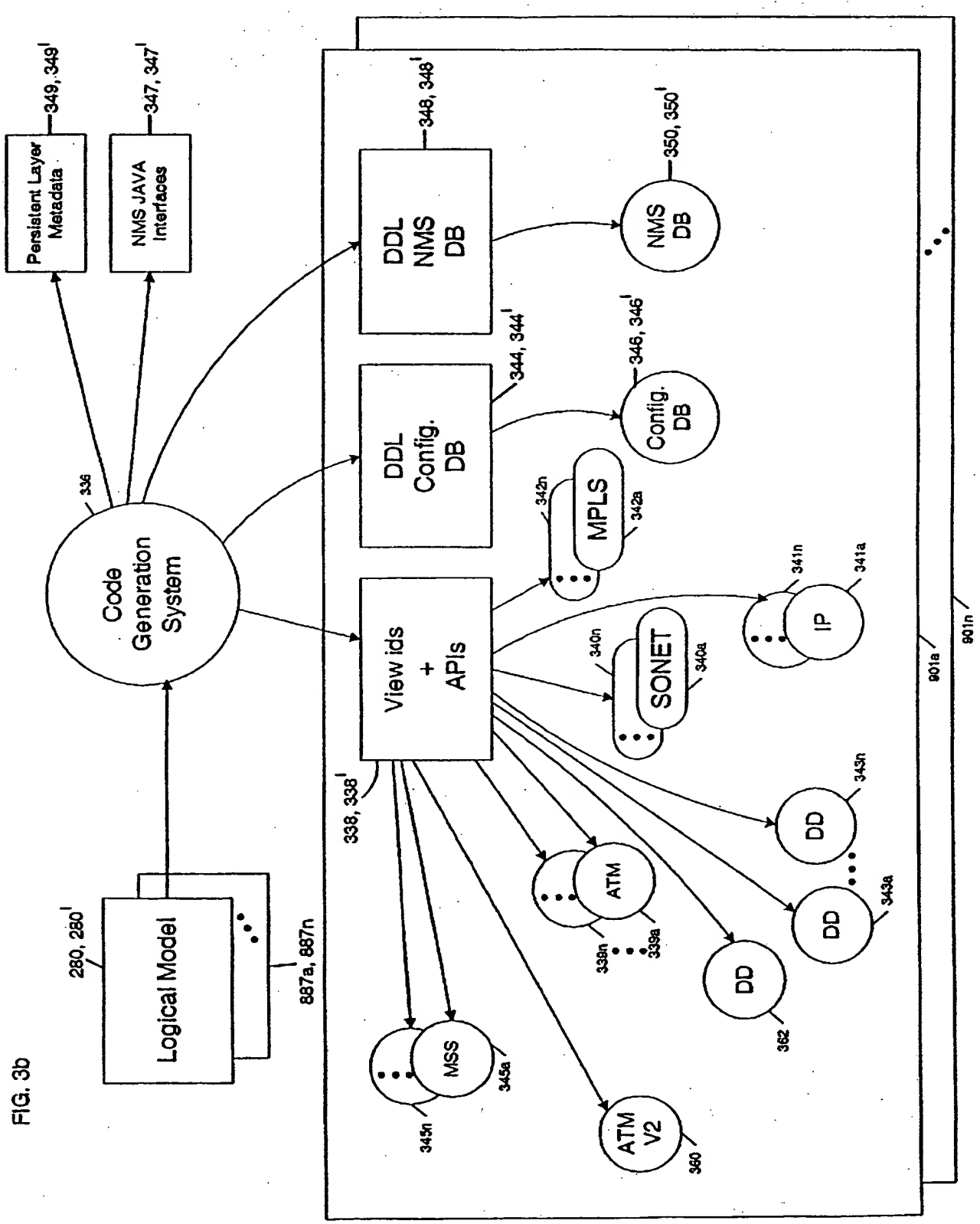

Persistent Layer Metadata
349, 349'
NMS JAVA Interfaces
347, 347'
336
Code Generation System
Logical Model
280, 280'
887a, 887n
DDL NMS DB
348, 348'
DDL Config. DB
344, 344'
View ids + APIs
338, 338'
NMS DB
350, 350'
Config. DB
346, 346'
MPLS
342a
342n
SONET
340a
340n
IP
341a
341n
ATM
339a
338n
DD
343a
343n
DD
362
MSS
345a
345n
ATM V2
360
901a
901n

FIG. 3b

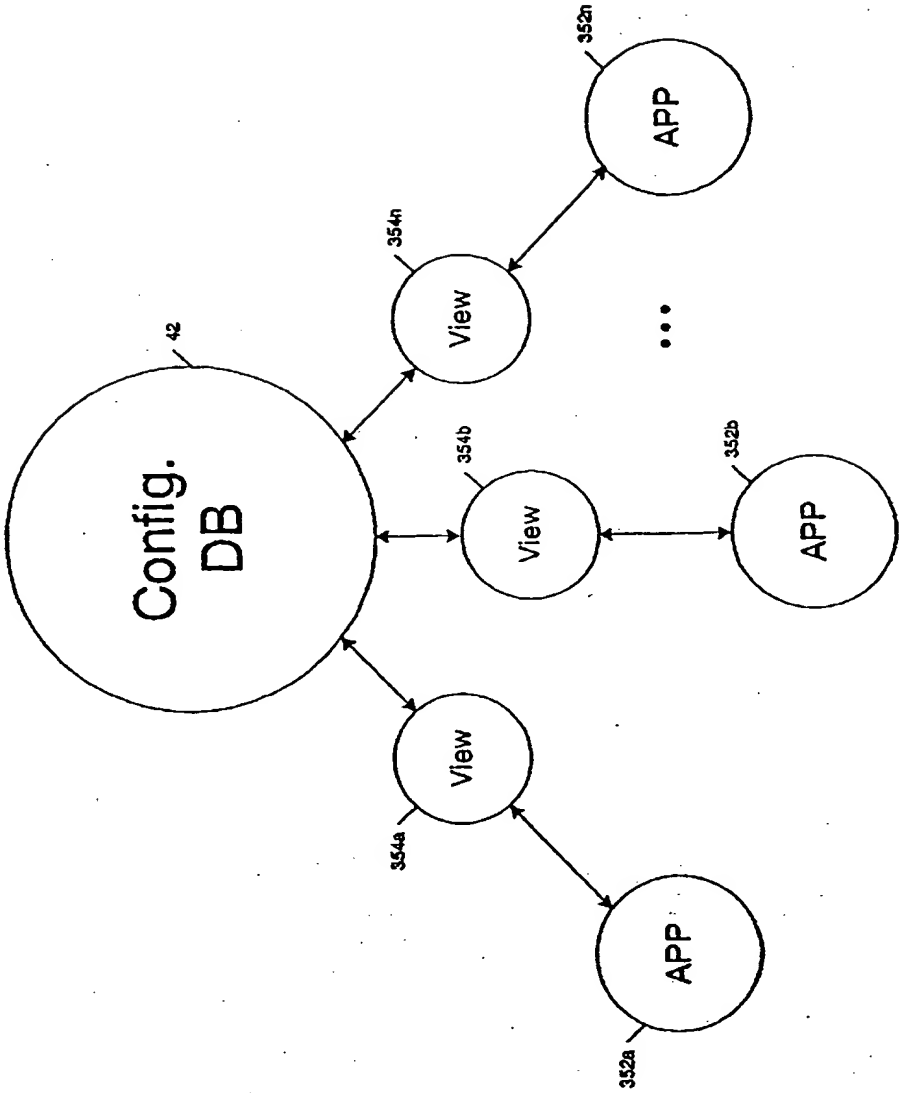
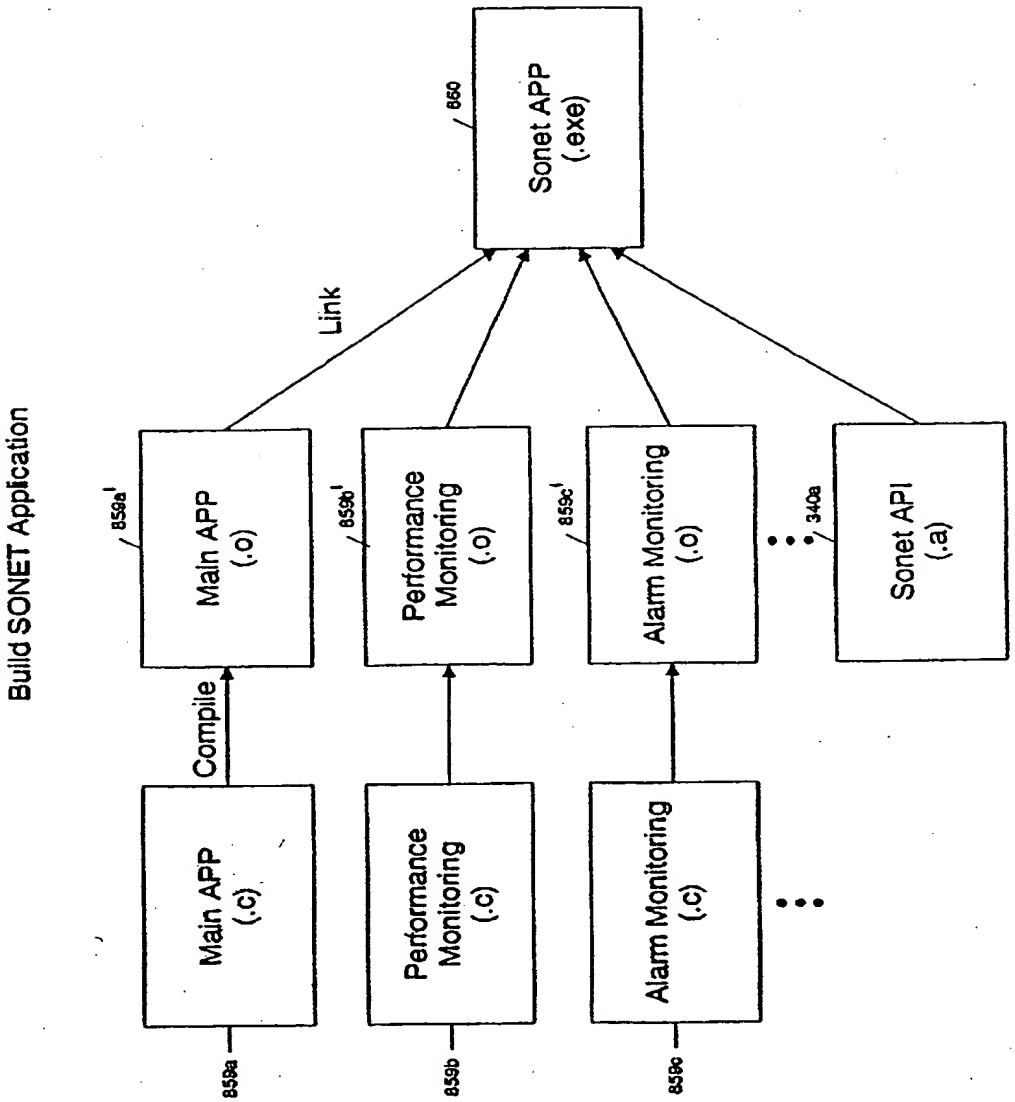

Config. DB
42
View
354a
View
354b
View
354n
APP
352a
APP
352b
APP
352n

FIG. 3c

Fig. 3d


Build SONET Application
Main APP (.c)
Compile
Main APP (.o)
Performance Monitoring (.c)
Performance Monitoring (.o)
Alarm Monitoring (.c)
Alarm Monitoring (.o)
Sonet API (.a)
Link
Sonet APP (.exe)
858a
858b
858c
858a'
858b'
858c'
340a
850

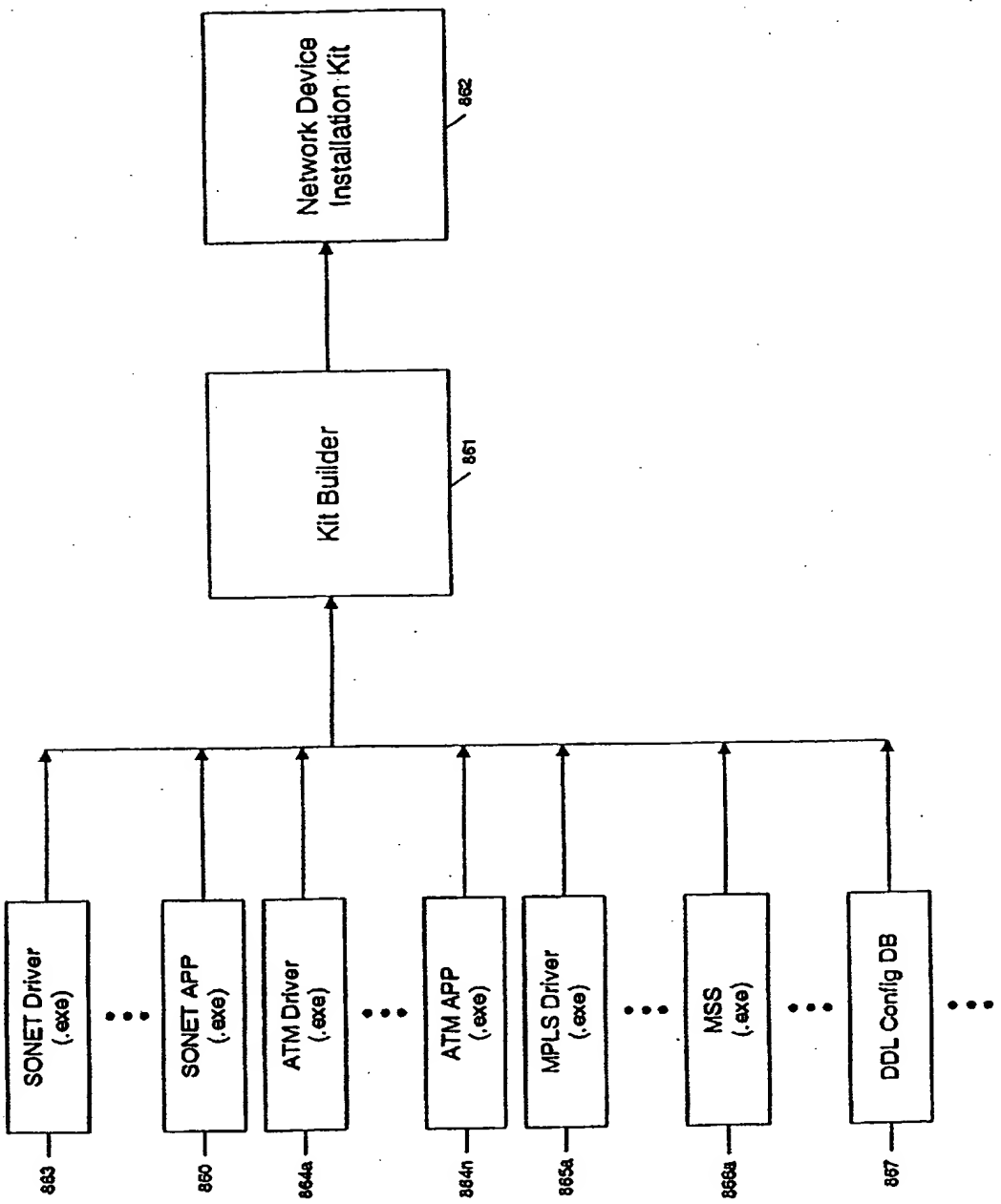

Network Device Installation Kit
862
Kit Builder
861
SONET Driver (.exe)
863
SONET APP (.exe)
860
ATM Driver (.exe)
864a
ATM APP (.exe)
864n
MPLS Driver (.exe)
865a
MSS (.exe)
866a
DDL Config DB
867

Fig. 3e

Fig. 3F

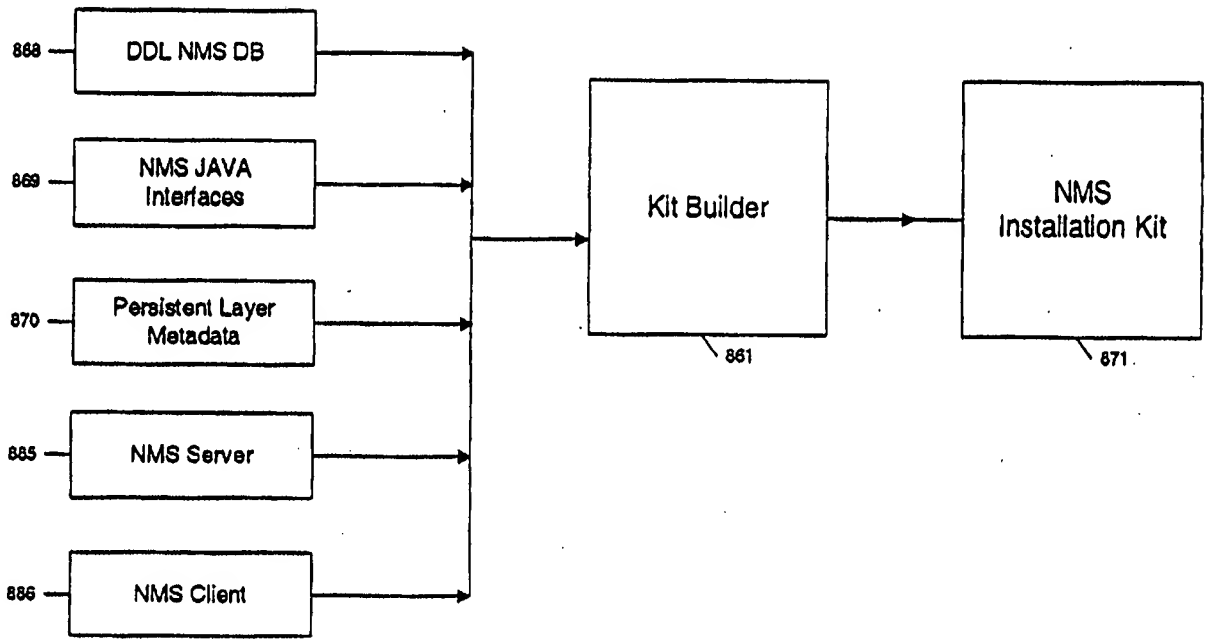
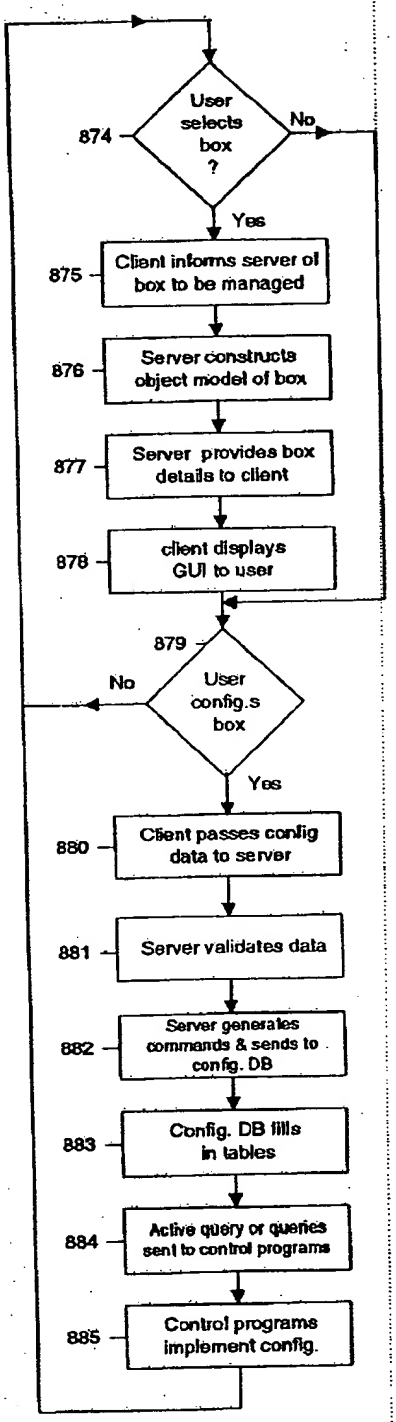

868
DDL NMS DB
869
NMS JAVA Interfaces
870
Persistent Layer Metadata
885
NMS Server
886
NMS Client
Kit Builder
861
NMS Installation Kit
871

Fig. 3g


874
User selects box ?
No
Yes
875
Client informs server of box to be managed
876
Server constructs object model of box
877
Server provides box details to client
878
client displays GUI to user
879
User config.s box
No
Yes
880
Client passes config data to server
881
Server validates data
882
Server generates commands & sends to config. DB
883
Config. DB fills in tables
884
Active query or queries sent to control programs
885
Control programs implement config.

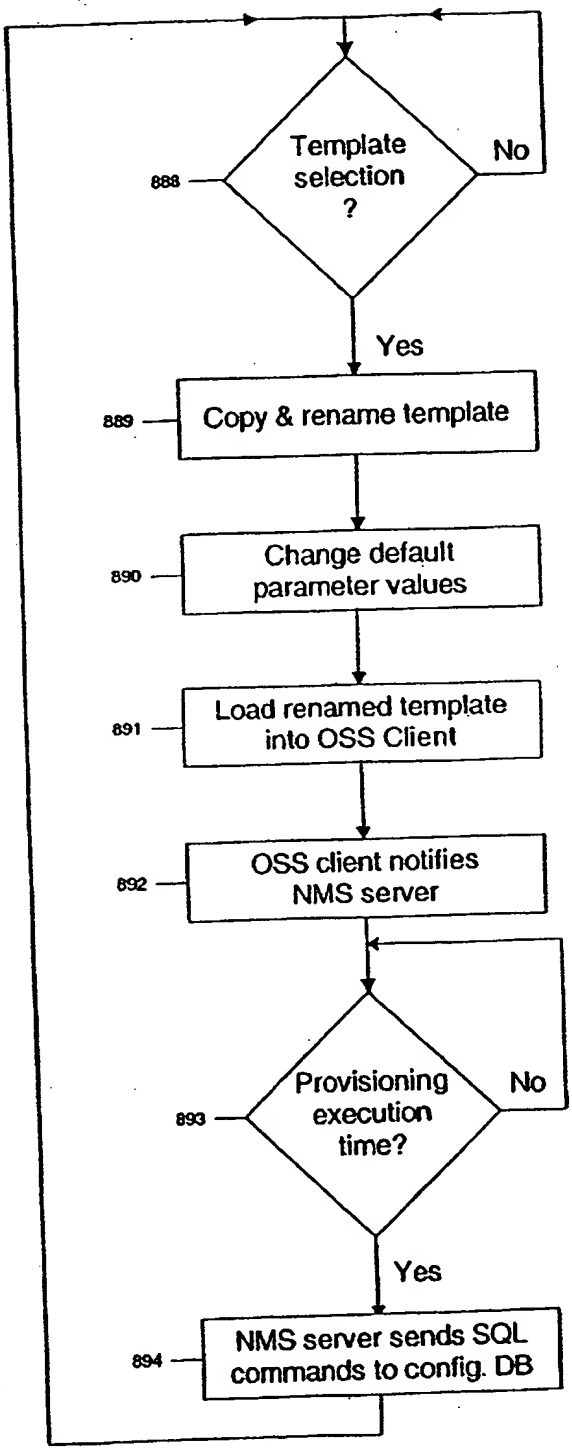


Fig. 3h

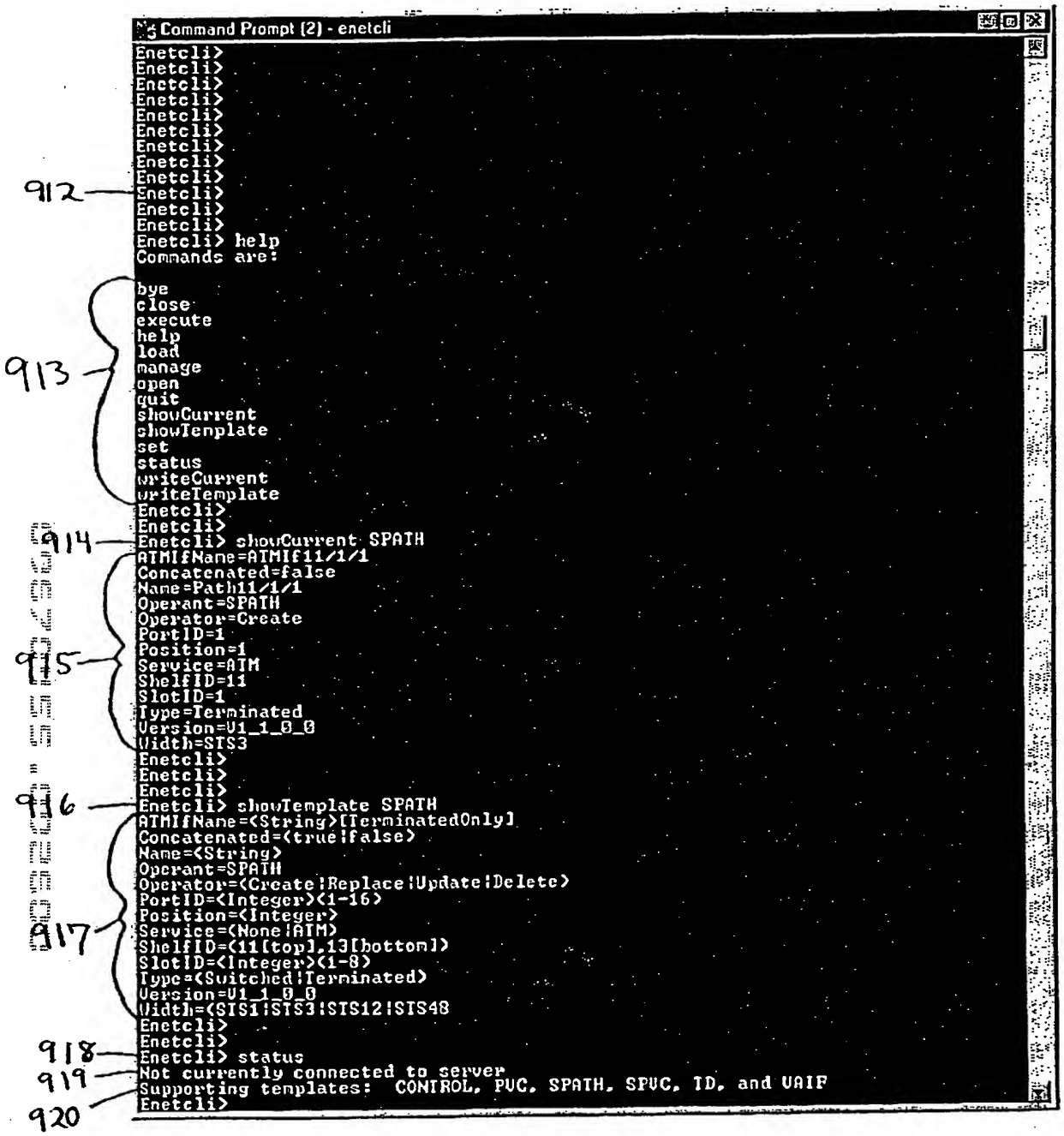

Command Prompt (2) - enetcli
Enetcli>
Enetcli> help
Commands are:
bye
close
execute
help
load
manage
open
quit
showCurrent
showTemplate
set
status
writeCurrent
writeTemplate
Enetcli> showCurrent SPATH
ATMIfName=ATMIf11/1/1
Concatenated=false
Name=Path11/1/1
Operant=SPATH
Operator=Create
PortID=1
Position=1
Service=ATM
ShelfID=11
SlotID=1
Type=Terminated
Version=V1_1_0_0
Width=STS3
Enetcli> showTemplate SPATH
ATMIfName=<String>[TerminatedOnly]
Concatenated=(true|false)
Name=<String>
Operant=SPATH
Operator=(Create|Replace|Update|Delete)
PortID=<Integer>(1-16)
Position=<Integer>
Service=(None|ATM)
ShelfID=(11[top],13[bottom])
SlotID=<Integer>(1-8)
Type=(Switched|Terminated)
Version=V1_1_0_0
Width=(STS1|STS3|STS12|STS48
Enetcli> status
Not currently connected to server
Supporting templates: CONTROL, PVC, SPATH, SPVC, TD, and VAIF
Enetcli>
912
913
914
915
916
917
918
919
920

Fig. 3i

Fig. 3j

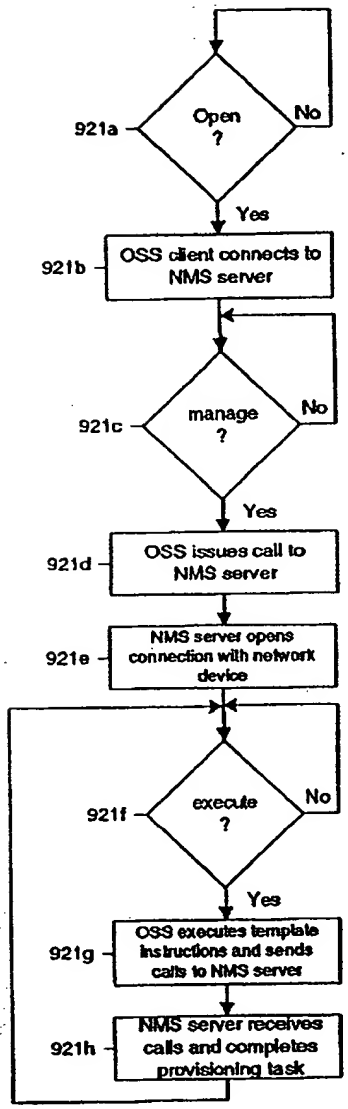

921a
Open ?
No
Yes
921b
OSS client connects to NMS server
921c
manage ?
No
Yes
921d
OSS issues call to NMS server
921e
NMS server opens connection with network device
921f
execute ?
No
Yes
921g
OSS executes template instructions and sends calls to NMS server
921h
NMS server receives calls and completes provisioning task

Fig. 3K

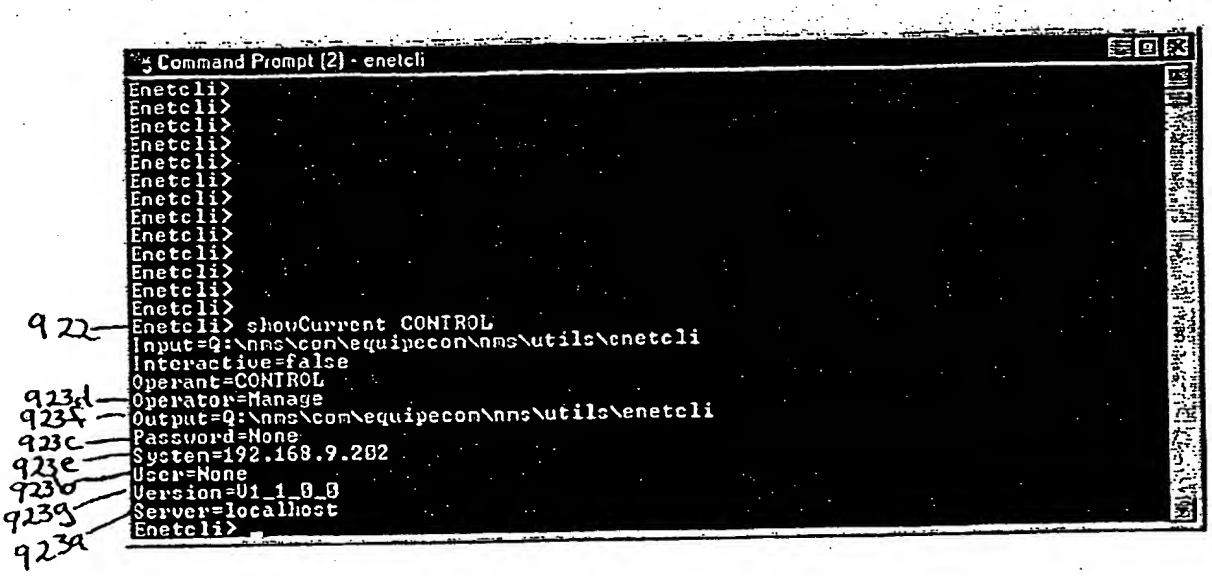

Command Prompt (2) - enetcli
Enetcli>
Enetcli> showCurrent CONTROL
Input=Q:\nms\com\equipecon\nms\utils\enetcli
Interactive=false
Operant=CONTROL
Operator=Manage
Output=Q:\nms\com\equipecon\nms\utils\enetcli
Password=None
System=192.168.9.202
User=None
Version=V1_1_0_0
Server=localhost
Enetcli>
922
923d
923f
923c
923e
923b
9239
923a

Fig. 3L

924 BATCH.

Operant=BATCH
Operator=Execute
Version=V1_1_0_0
924a — Task1=execute-SPATH
924b — Task2=execute-PVC
924c — Task3=execute-SPVC
924d — Task4=load-SPVC-spvc1
924e — Task5=execute-SPVC
924f — Task6=load-SPVC-spvc2
924g — Task7=execute-SPVC

.
.
.

924g — Task50=set-SPATH-PortID-3
924h — Task51=execute-SPATH
924i — Task52=set-SPATH-SlotID-2
924j — Task53=execute-SPATH

Fig. 3M

925

Operant=BATCH
Operator=Execute
Version=V1_1_0_0
925a Task1=execute-CONTROL
925b Task2=execute-SPATH
925c Task3=set-SPATH-PortID-3
925d Task4=execute-SPATH
.
.
.
925e Task61=set-CONTROL-System-192.168.9.201
925f Task62=execute-CONTROL
925g Task63=execute-SPATH
.
.
.
925h Task108=close
925i Task109=set-CONTROL-Server-Server1
925j Task110=set-CONTROL-System-192.168.8.200
925k Task111=execute-CONTROL
925l Task112=execute-SPATH
.
.
.

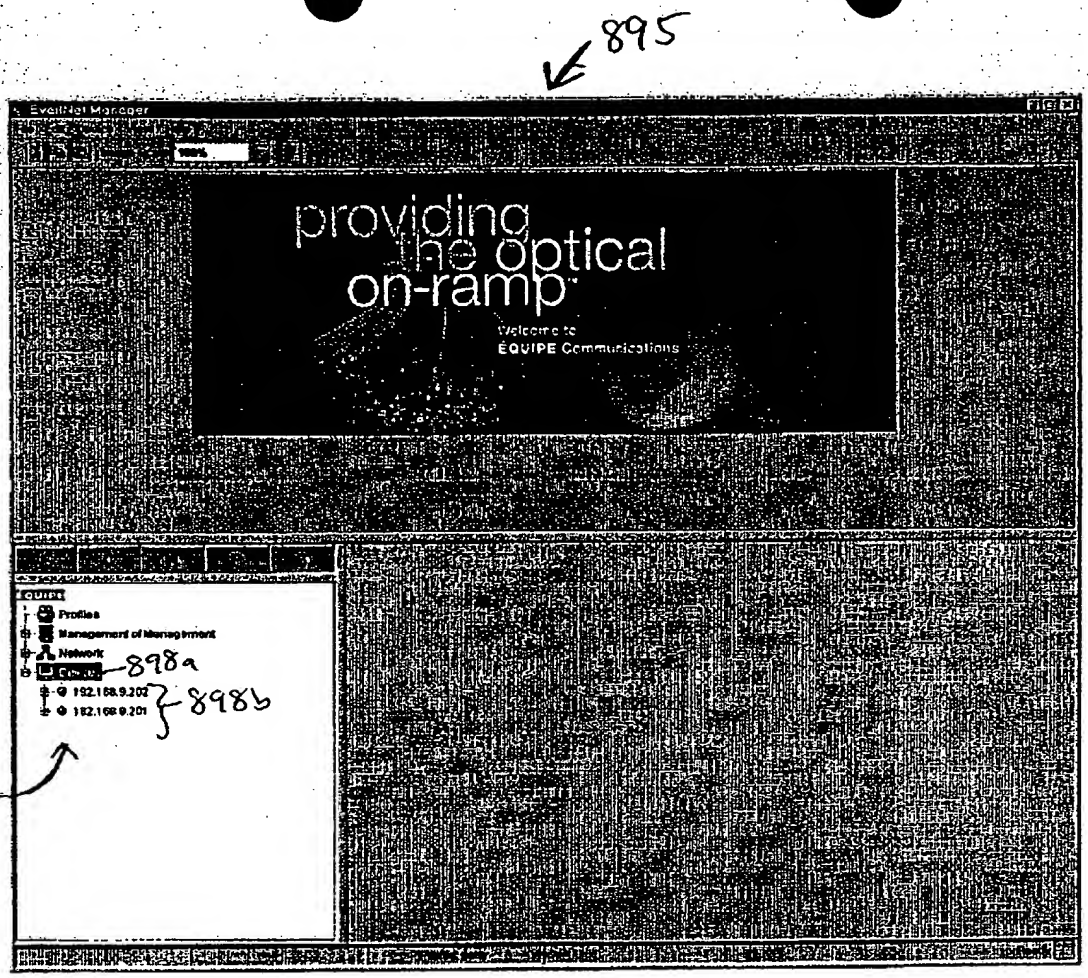

895
providing
the optical
on-ramp
Welcome to
EQUIPE Communications
EQUIPE
Profiles
Management of Management
Network
898a
192.168.9.202
192.168.9.201
898b
898

Fig. 4a

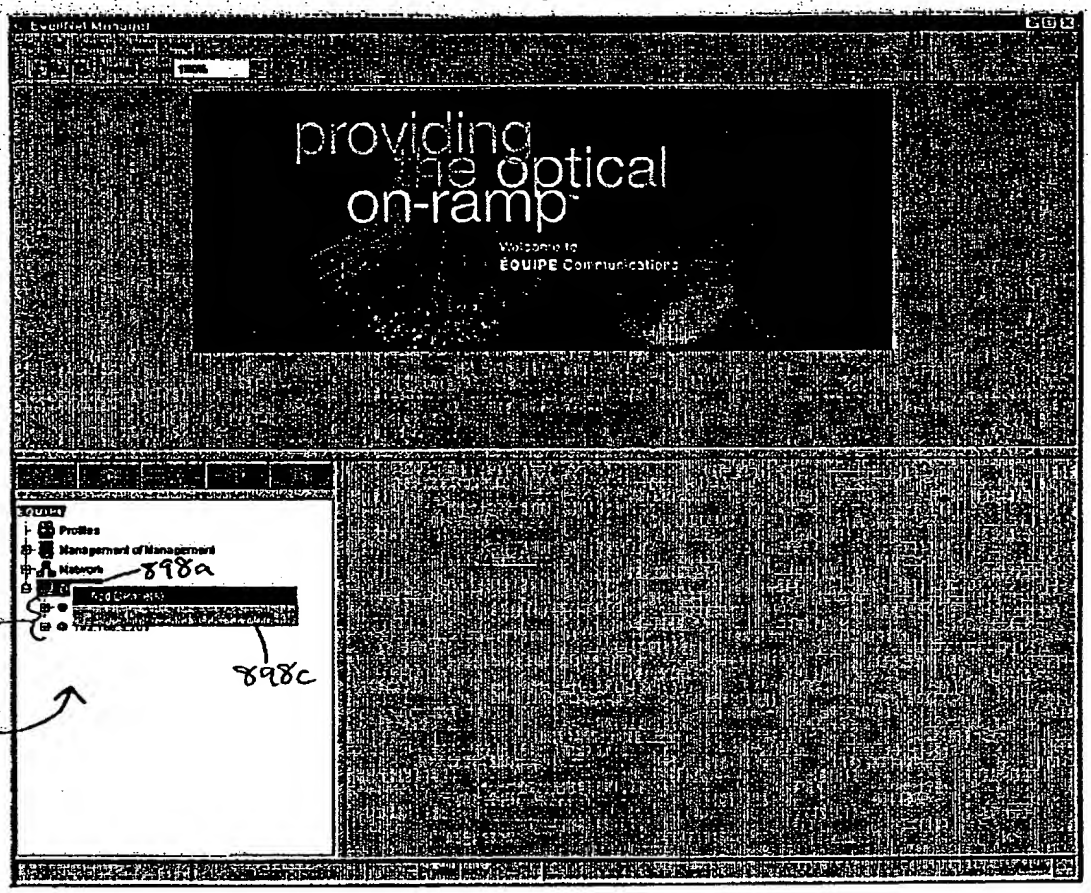

895
providing
the optical
on-ramp
Welcome to
EQUIPE Communications
898a
898b
898c
898

Fig. 4b

Fig. 4c

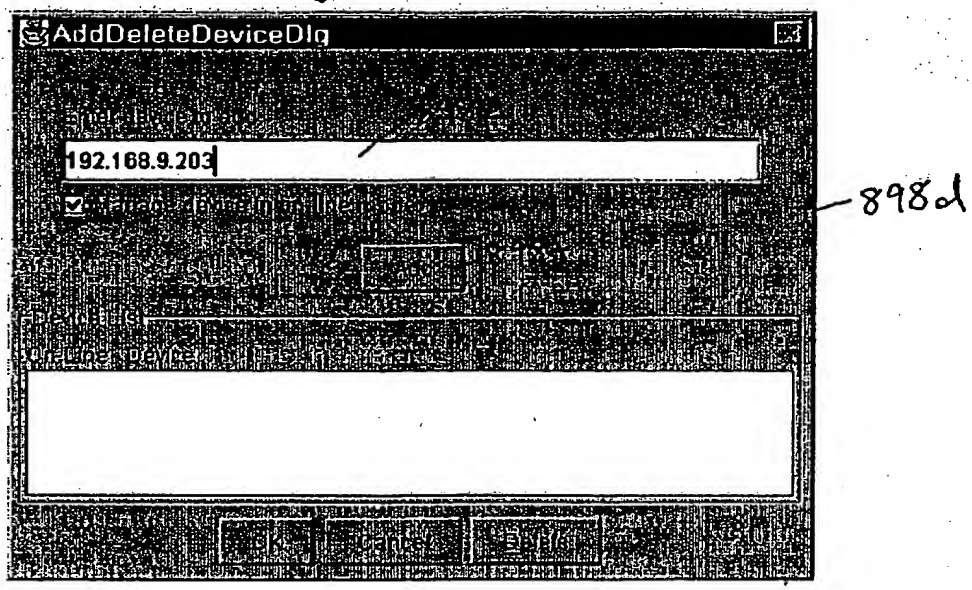
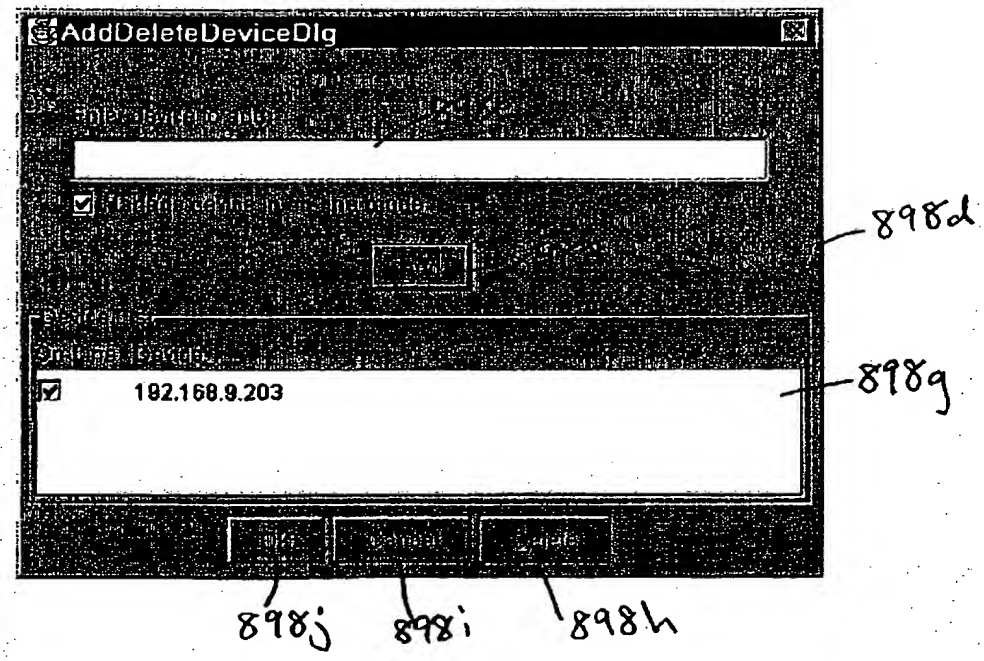

AddDeleteDeviceDlg
192.168.9.203
898d

Fig. 4d


AddDeleteDeviceDlg
898d
192.168.9.203
898g
898j
898i
898h

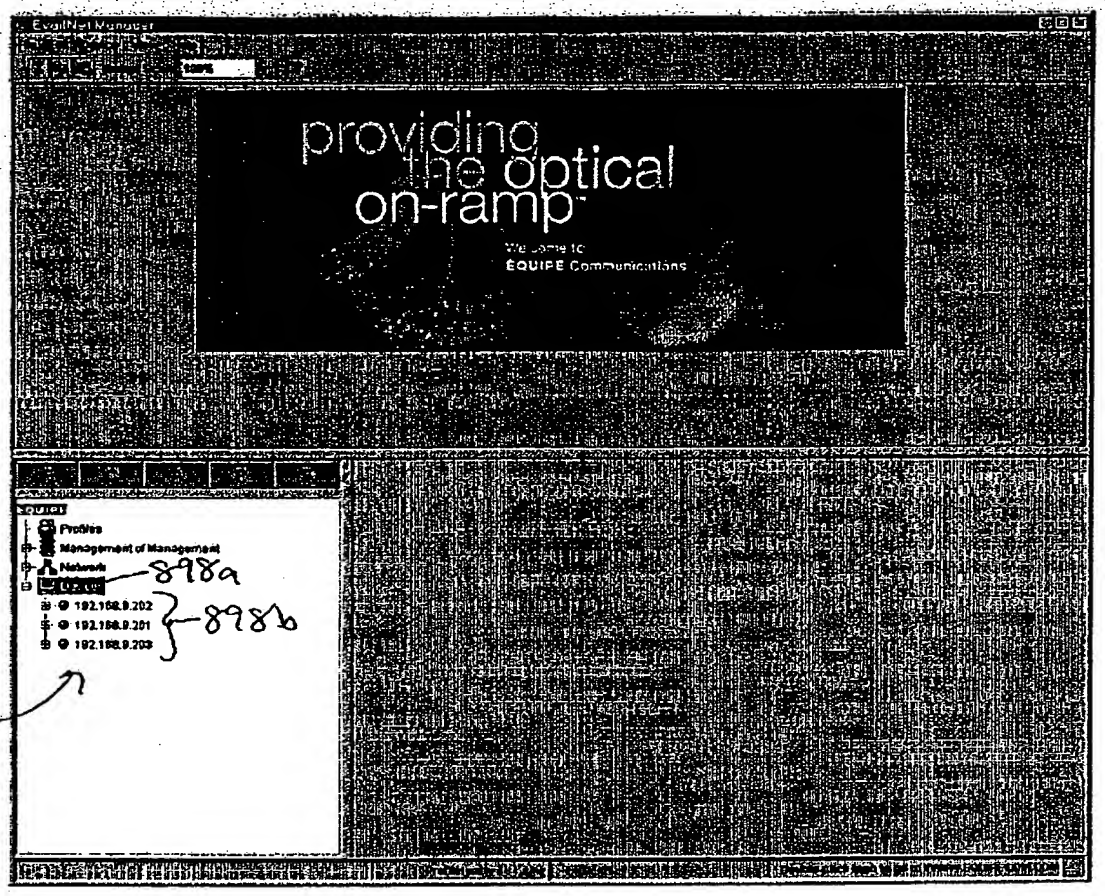

providing
the optical
on-ramp
EQUIPE Communications
Profiles
Management of Management
Network
192.168.9.202
192.168.9.201
192.168.9.203
895
898
898a
898b

Fig. 4e

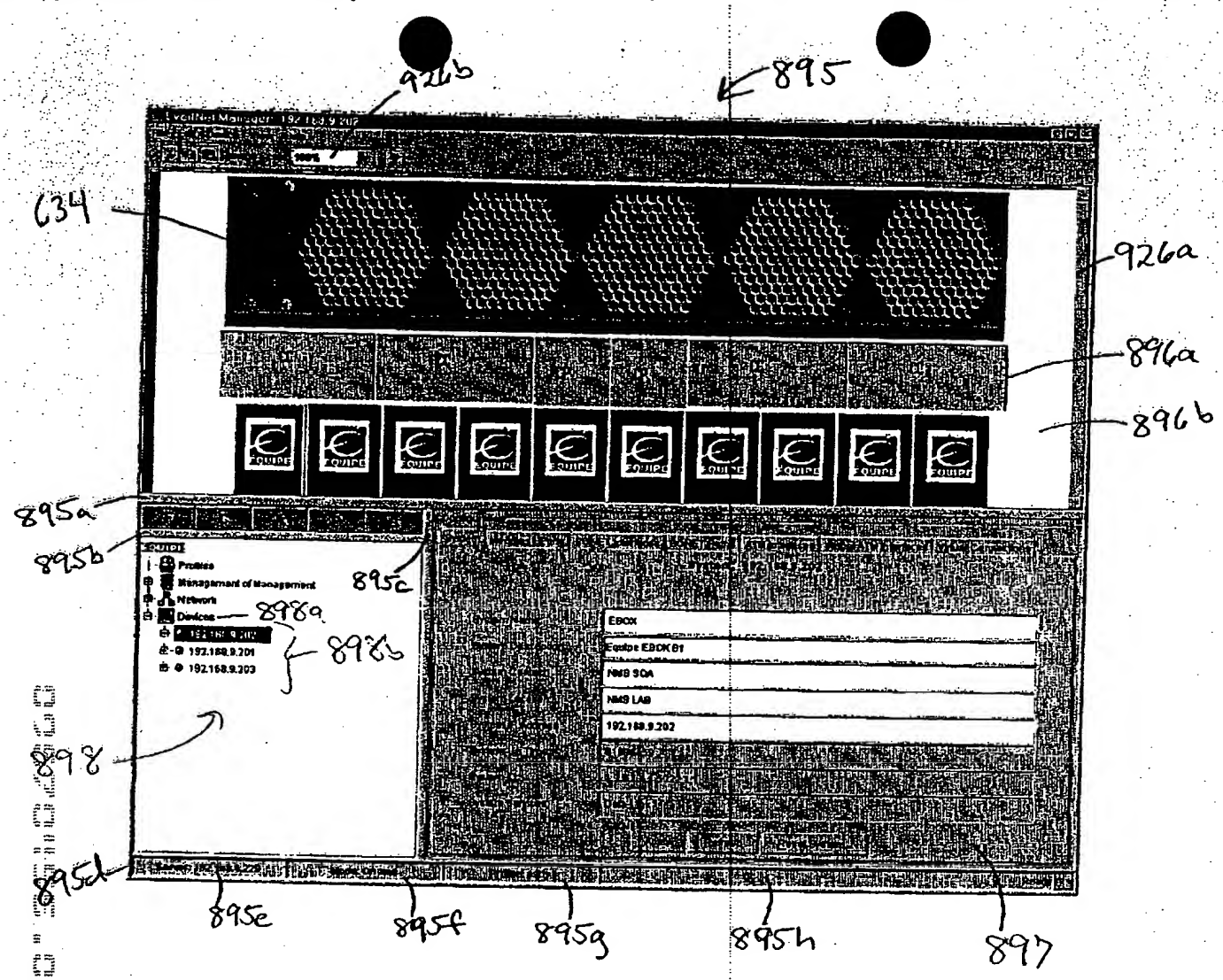

926b
895
634
926a
896a
896b
895a
895b
895c
898a
898b
898
895d
895e
895f
895g
895h
897
Profiles
Management of Management
Network
Devices
192.168.9.201
192.168.9.203
EBOX
Equipe EBOX01
NMS SQA
NMS LAB
192.168.9.202

Fig. 4f

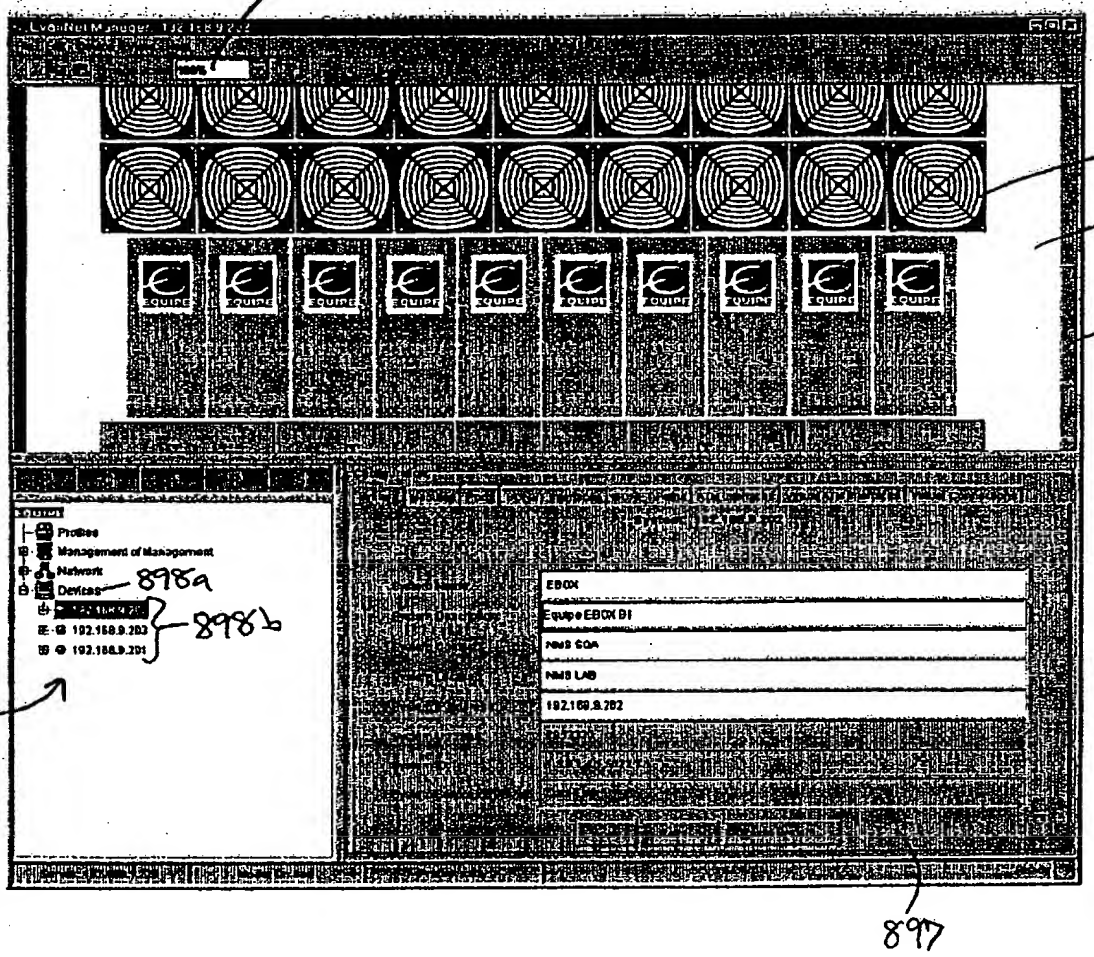

926b
895
896a
896b
926a
898a
898b
898
897
ProBee
Management of Management
Network
Devices
EBOX
Equipe EBOX BI
NMS SOA
NMS LAB
192.168.9.202

Fig. 4g

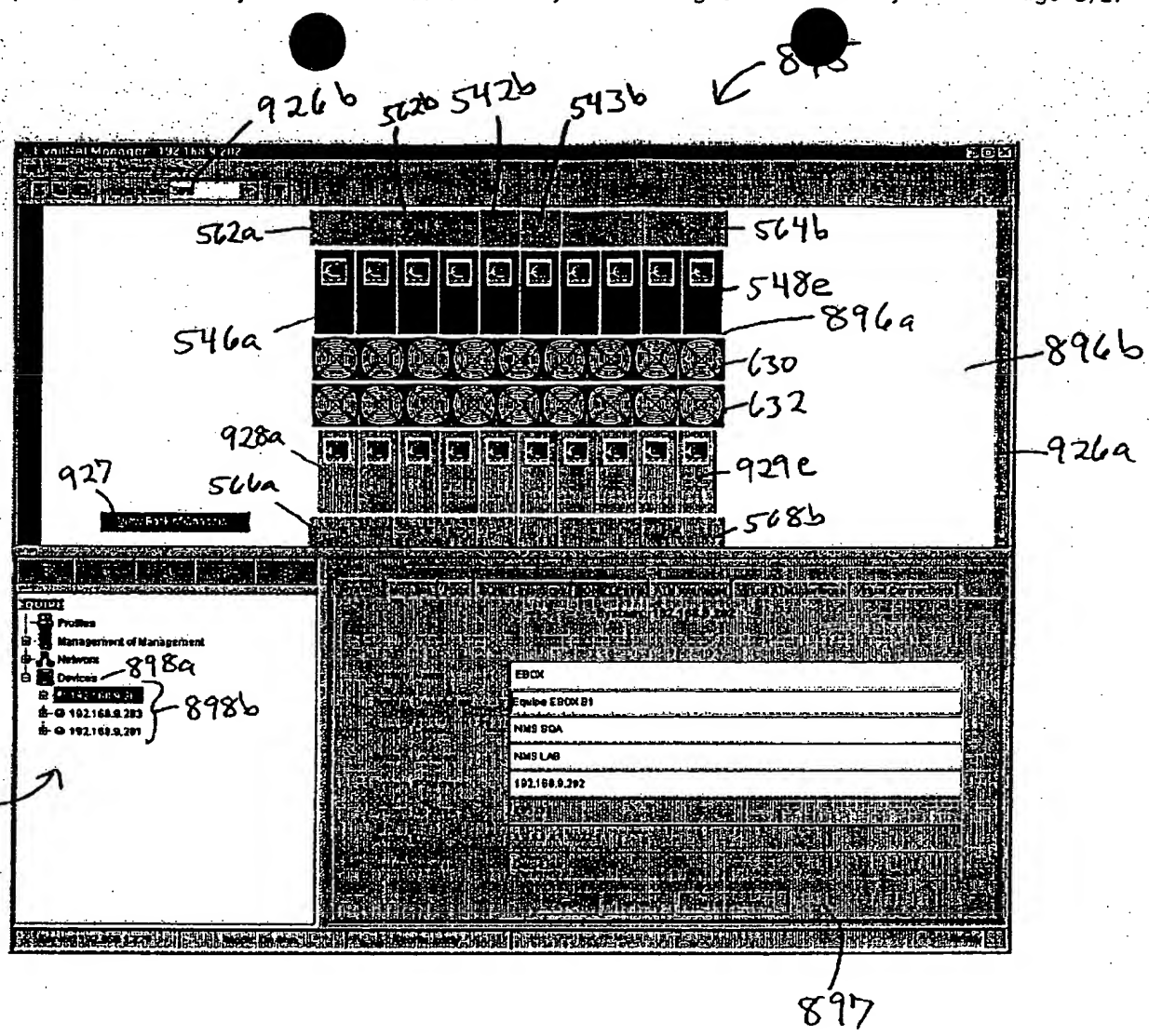

926b
562a
542b
543b
546b
548e
546a
896a
896b
630
632
928a
929e
926a
927
566a
568b
898a
898b
898
897

Fig. 4h

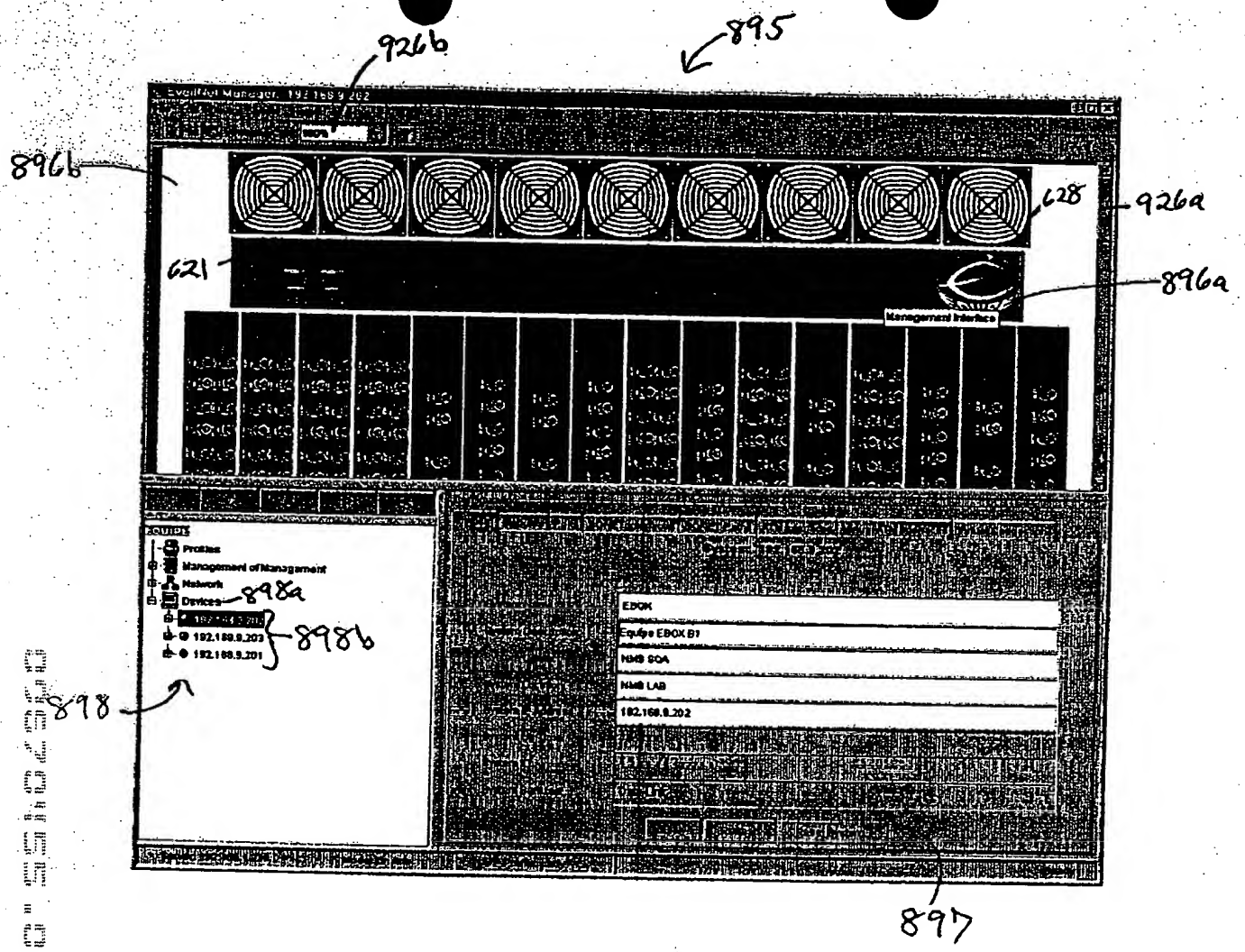

926b
895
896b
628
926a
621
896a
Management Interface
898a
898b
898
EBOX
Equipe EBOX B1
NMS SOA
NMS LAB
192.168.8.202
897

Fig. 4i

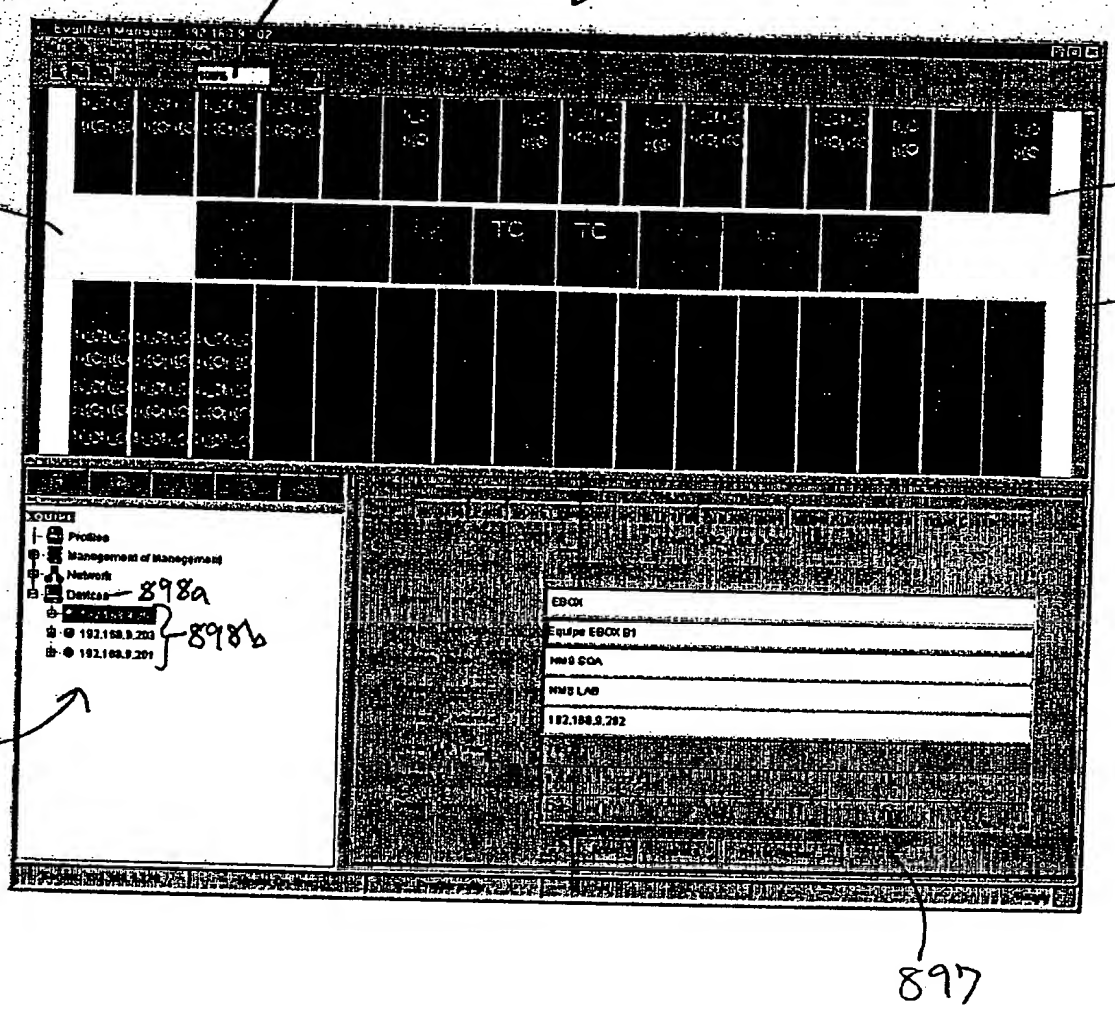

926b
895
896b
896a
926a
898a
898b
898
897
TC
TC
EBOX
Equipe EBOX B1
NMS SOA
NMS LAB
192.168.9.202

Fig. 4j

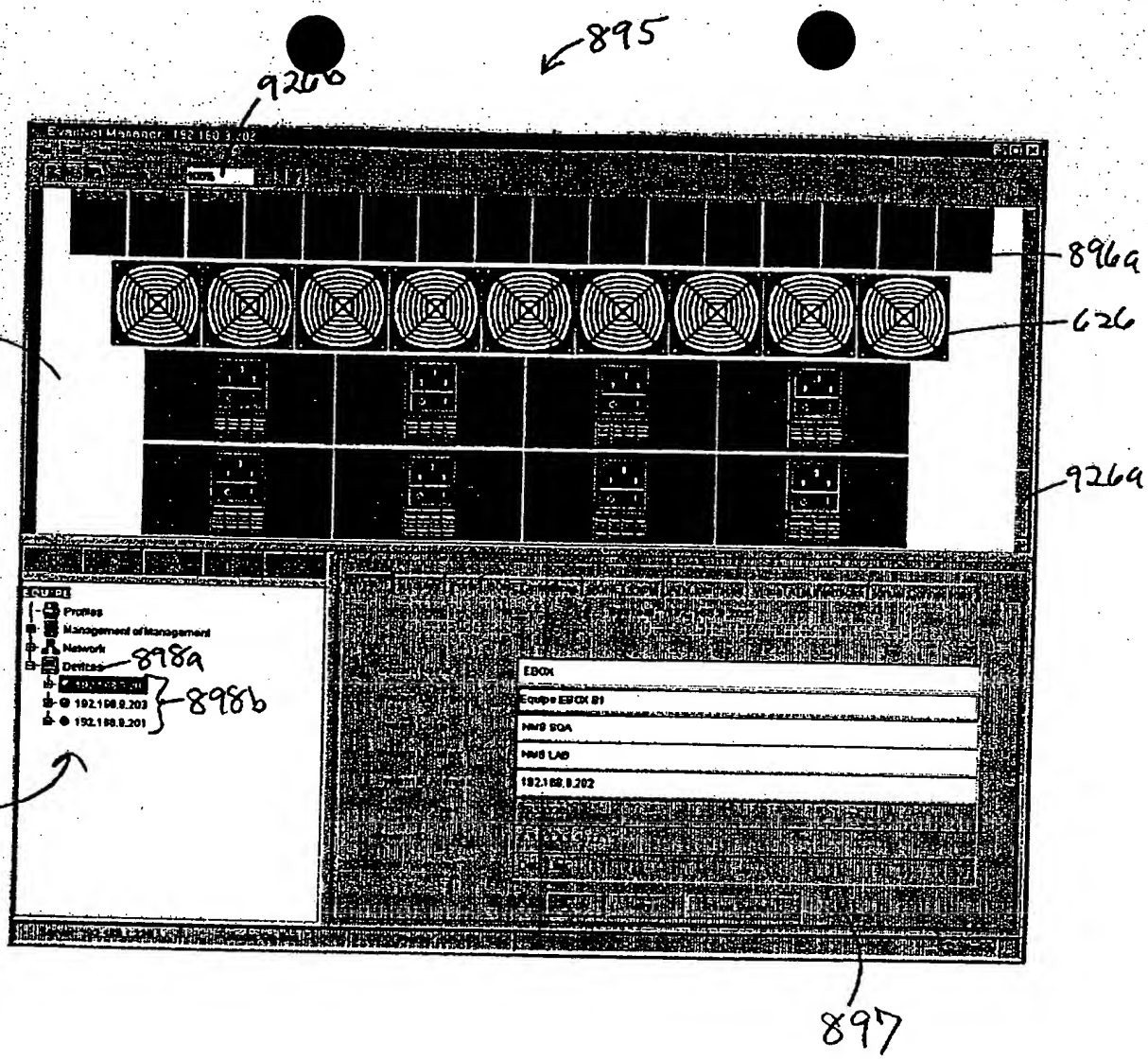

895
926b
896a
896b
626
926a
898a
898b
898
897
EBOX
Equipe EBOX 01
NMS SOA
NMS LAB
192.168.0.202

Fig. 4K

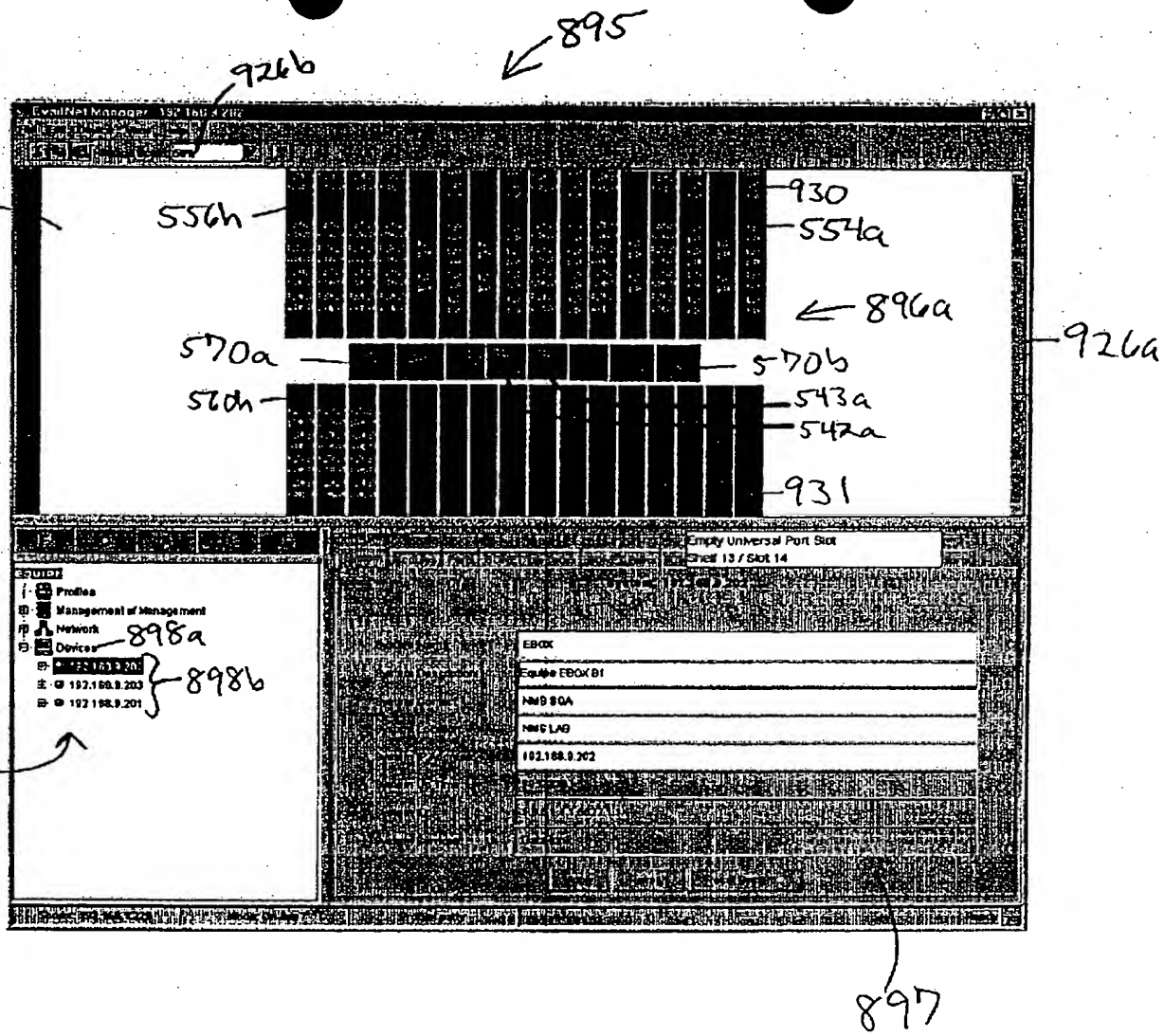

895
926b
896b
556h
930
554a
896a
926a
570a
570b
562h
543a
542a
931
898a
898b
898
897

Fig. 4L

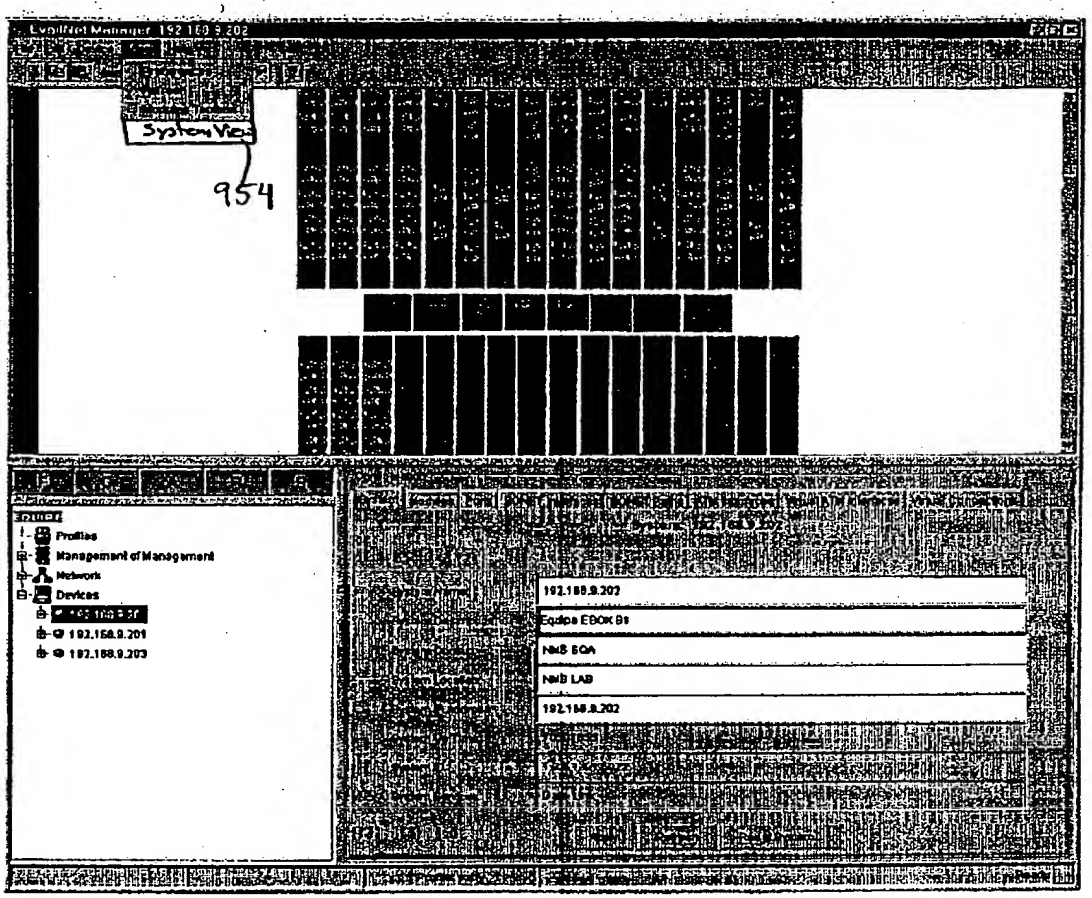

954
Profiles
Management of Management
Network
Devices
192.168.9.201
192.168.9.203
192.168.9.202
Equipe EBDK BI
NMS SOA
NMS LAB
192.168.9.202

Fig. 4m

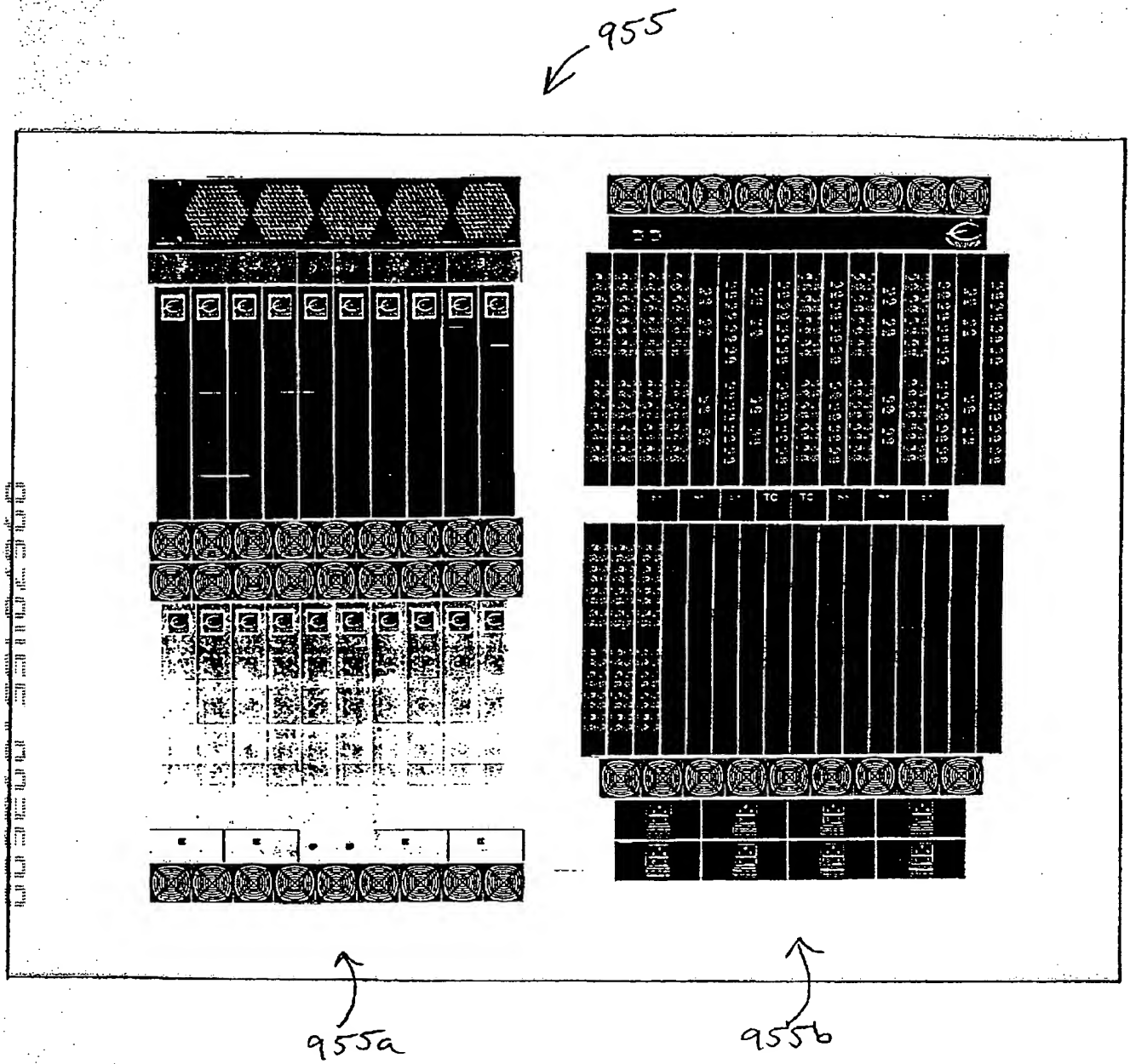


Fig. 4n

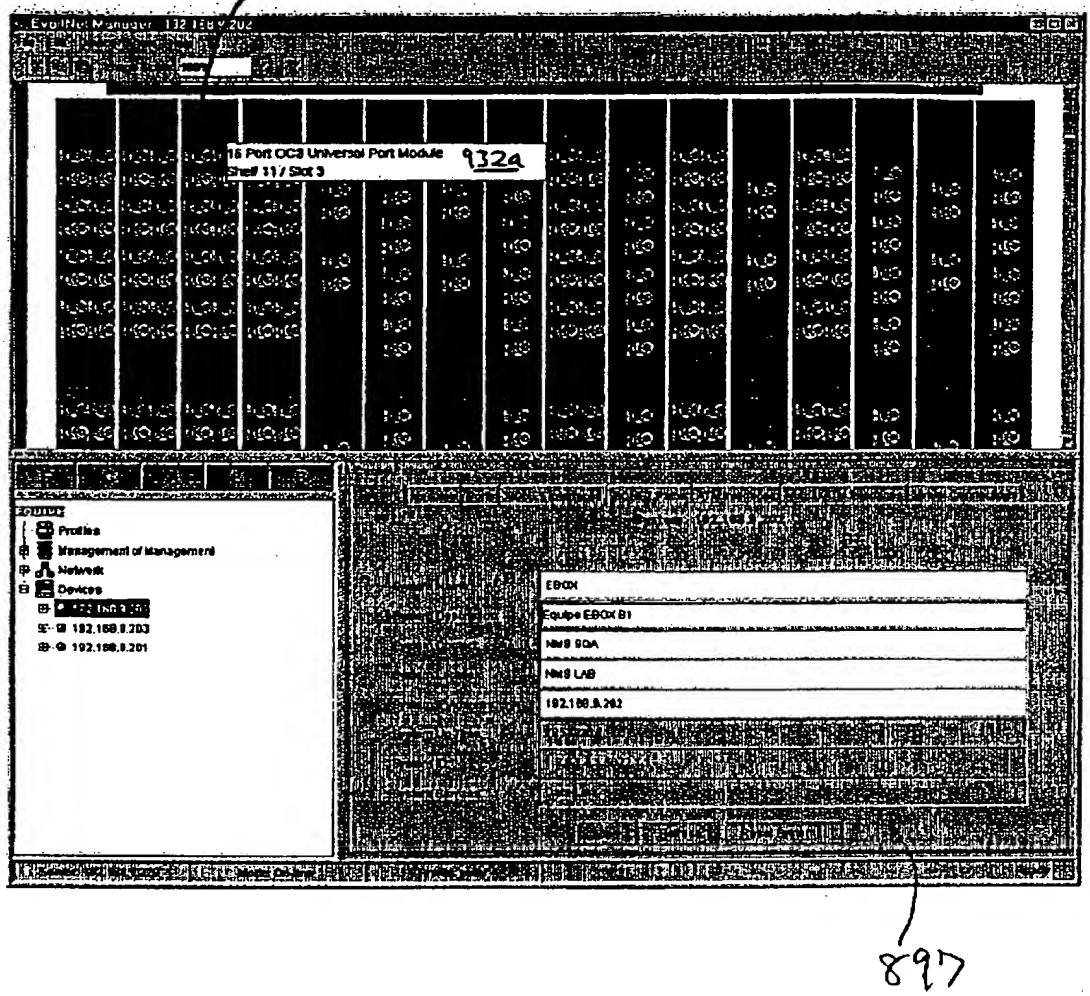

555
895
16 Port OC3 Universal Port Module
Shelf 11 / Slot 3
932a
Profiles
Management of Management
Network
Devices
192.168.9.203
192.168.9.201
EBOX
Equipe EBOX B1
Net9 SOA
Net9 LAB
192.168.9.202
897

Fig. 4o

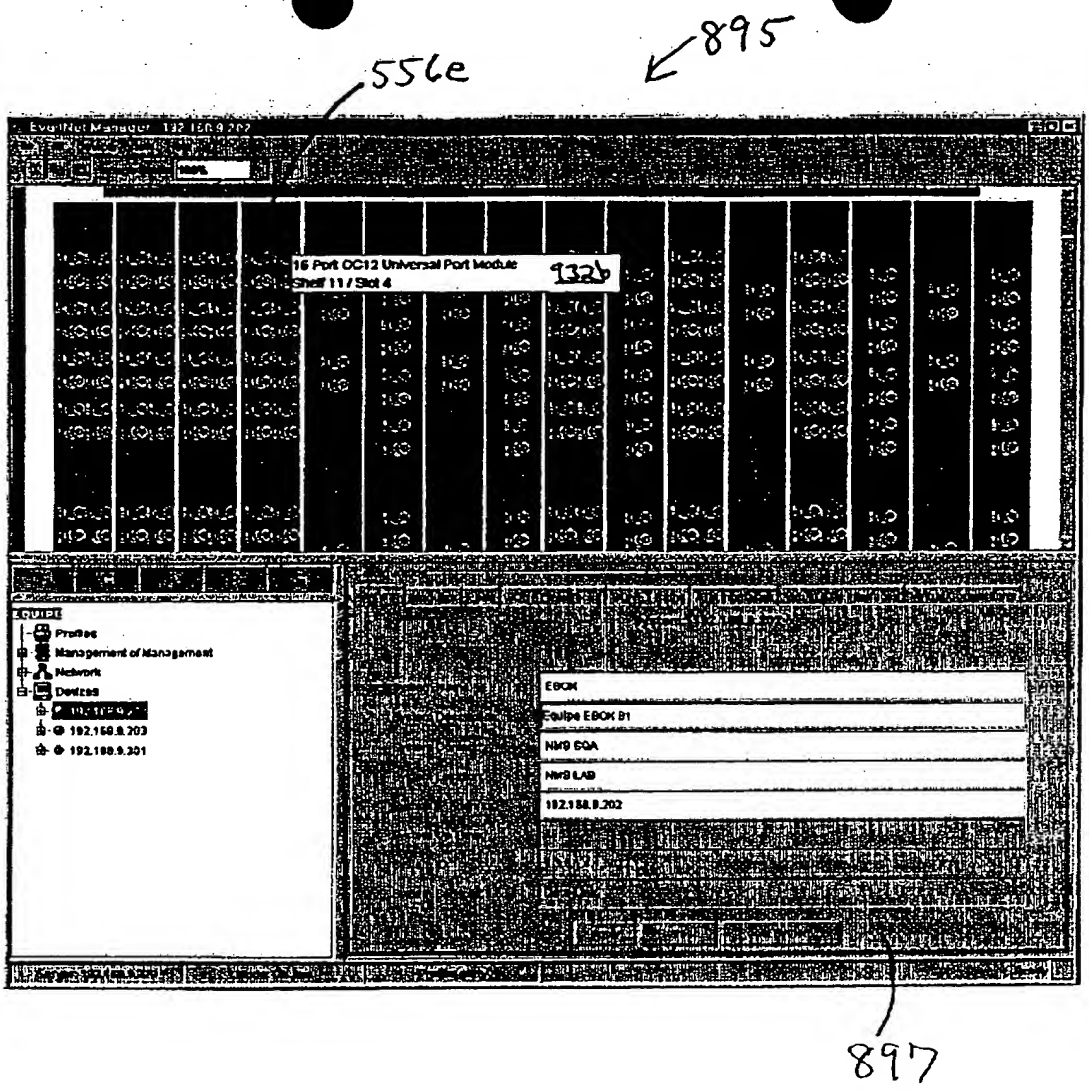

895
556
16 Port OC12 Universal Port Module
Shelf 11 / Slot 4
932b
EQUIPE
Profiles
Management of Management
Network
Devices
192.168.9.203
192.168.9.301
EBOK
Equipe EBOK 81
NMS SQA
NMS LAB
192.168.9.202
897

Fig. 4P

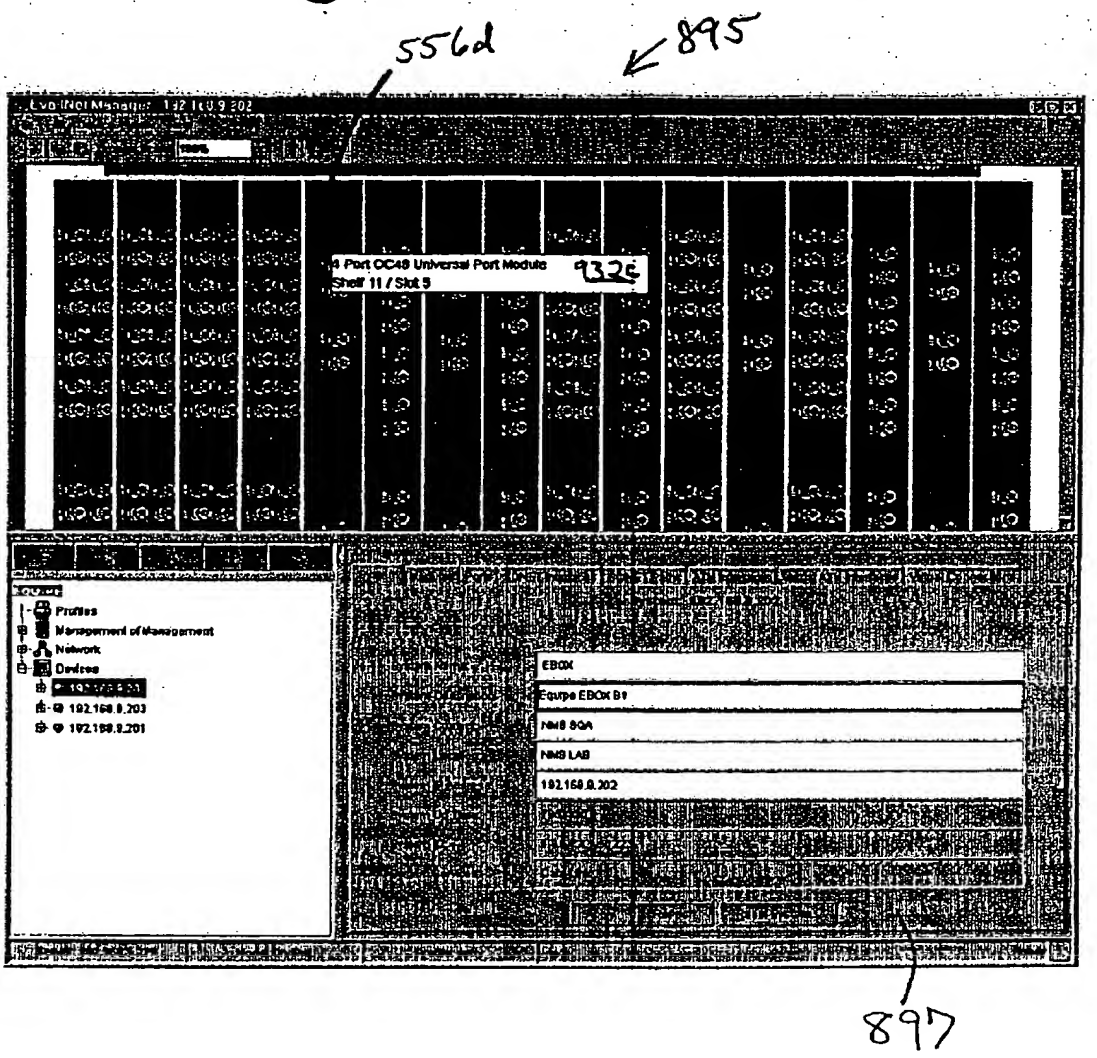

556d
895
4 Port OC48 Universal Port Module
Shelf 11 / Slot 5
9325
Profiles
Management of Management
Network
Devices
192.168.9.203
192.168.9.201
EBOX
Equipe EBOx 9#
NMS SQA
NMS LAB
192.168.9.202
897

Fig. 4g

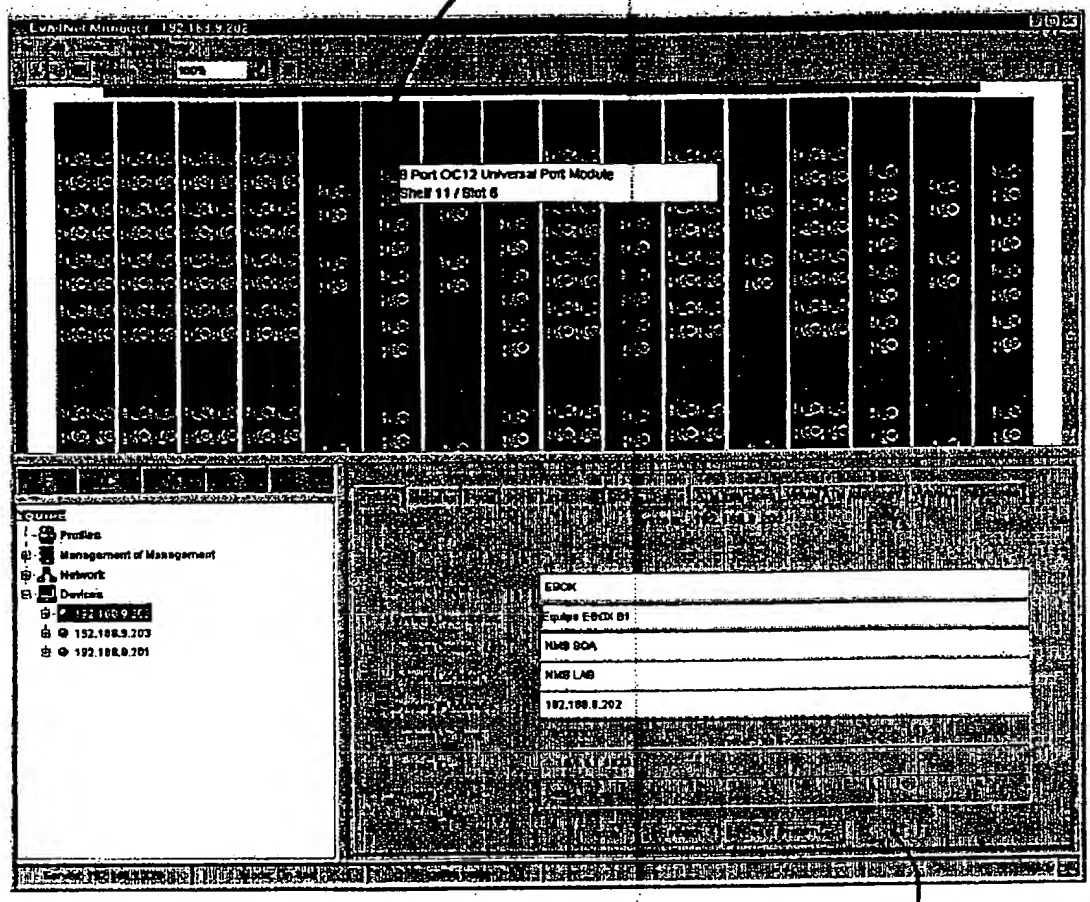

556c
895
8 Port OC12 Universal Port Module
Shelf 11 / Slot 6
EQUIPE
Profiles
Management of Management
Network
Devices
152.188.9.203
192.188.9.201
EDCX
Equipe EDCX B1
NMS SOA
NMS LAB
192.188.8.202
897

Fig. 4F

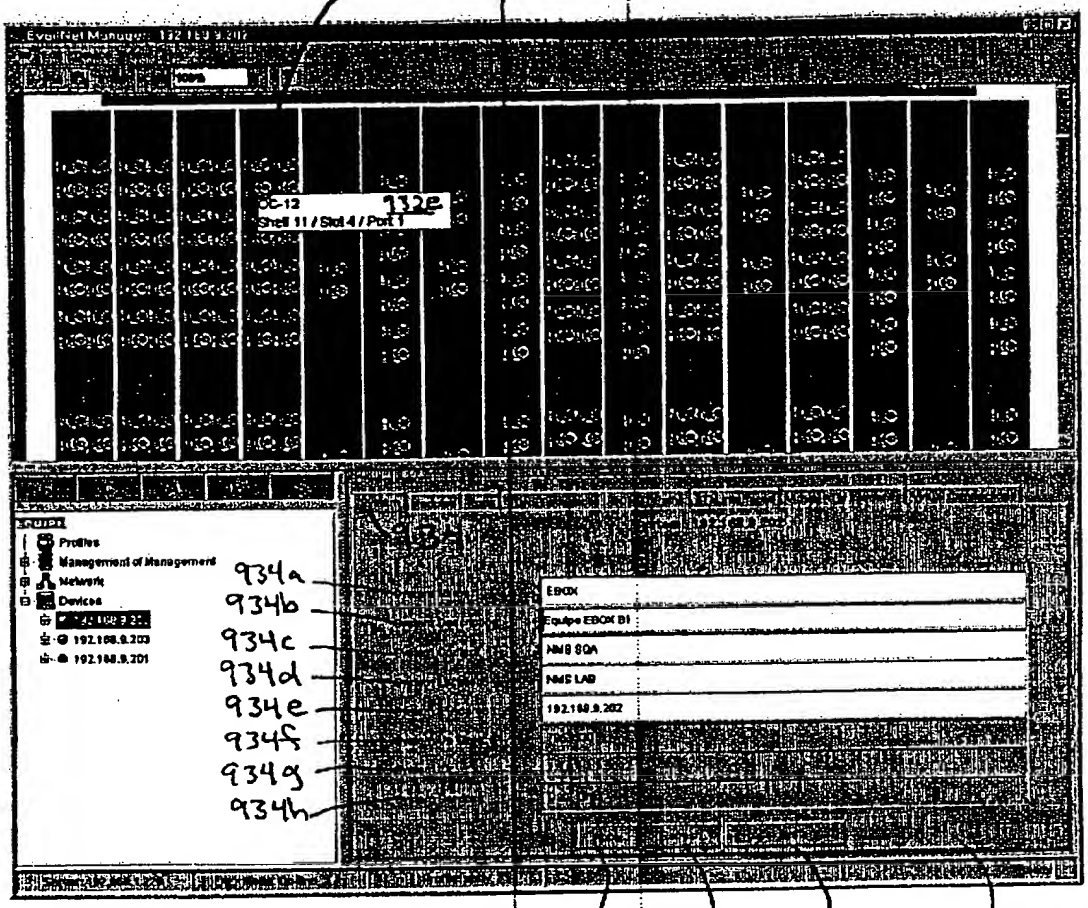

895
933
932e
934a
934b
934c
934d
934e
934f
934g
934h
935a
935c
935b
897

Fig. 4s

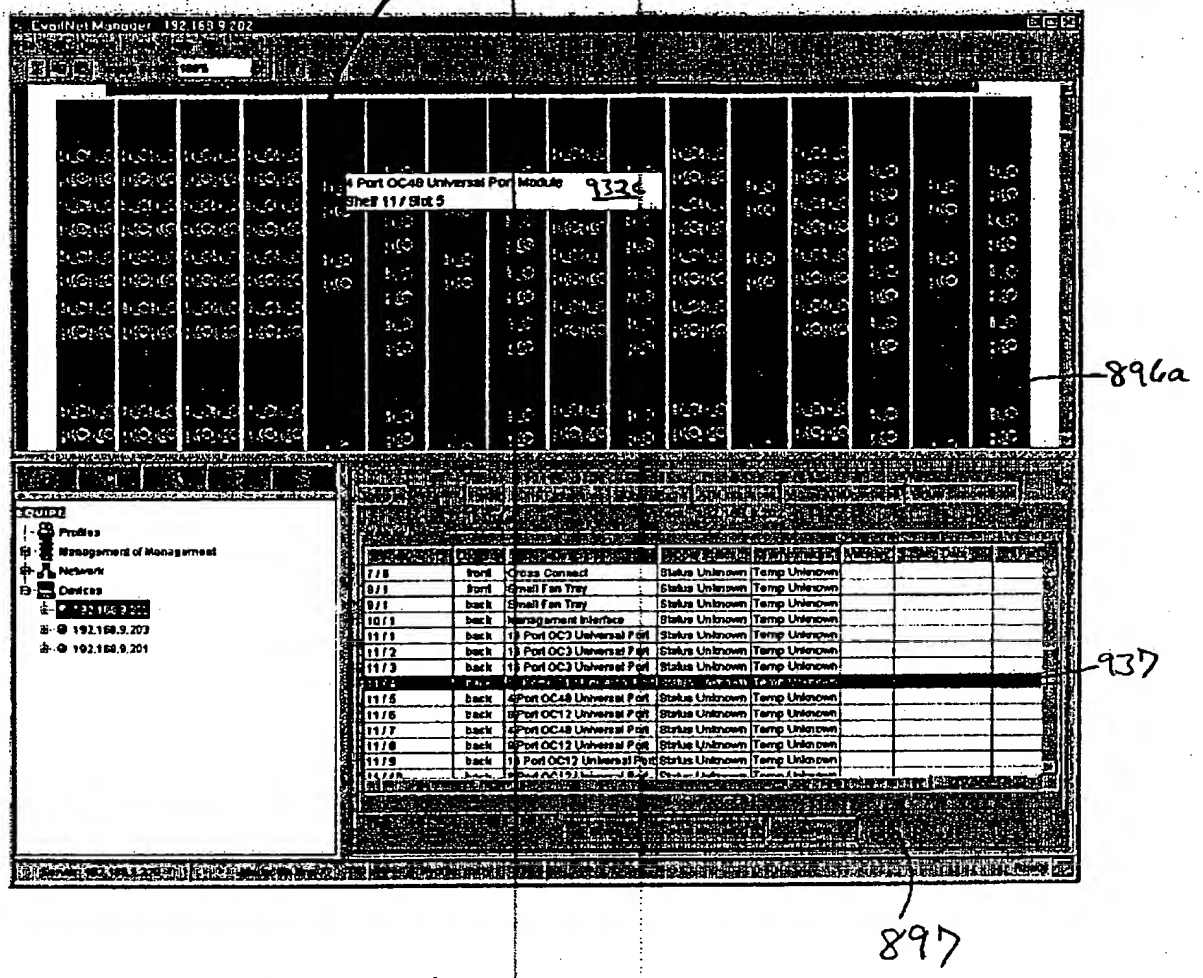


Fig. 44

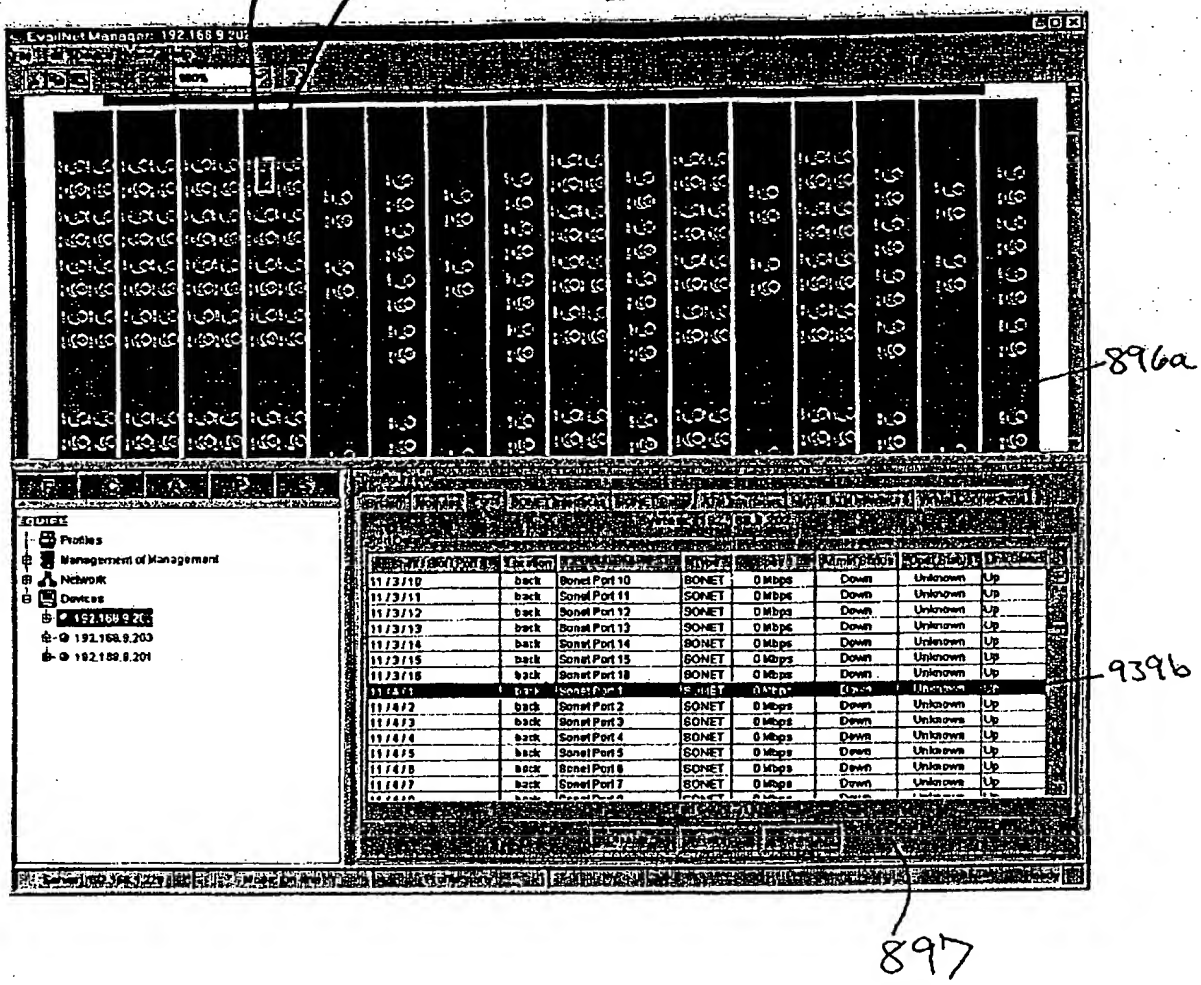


Fig. 4u

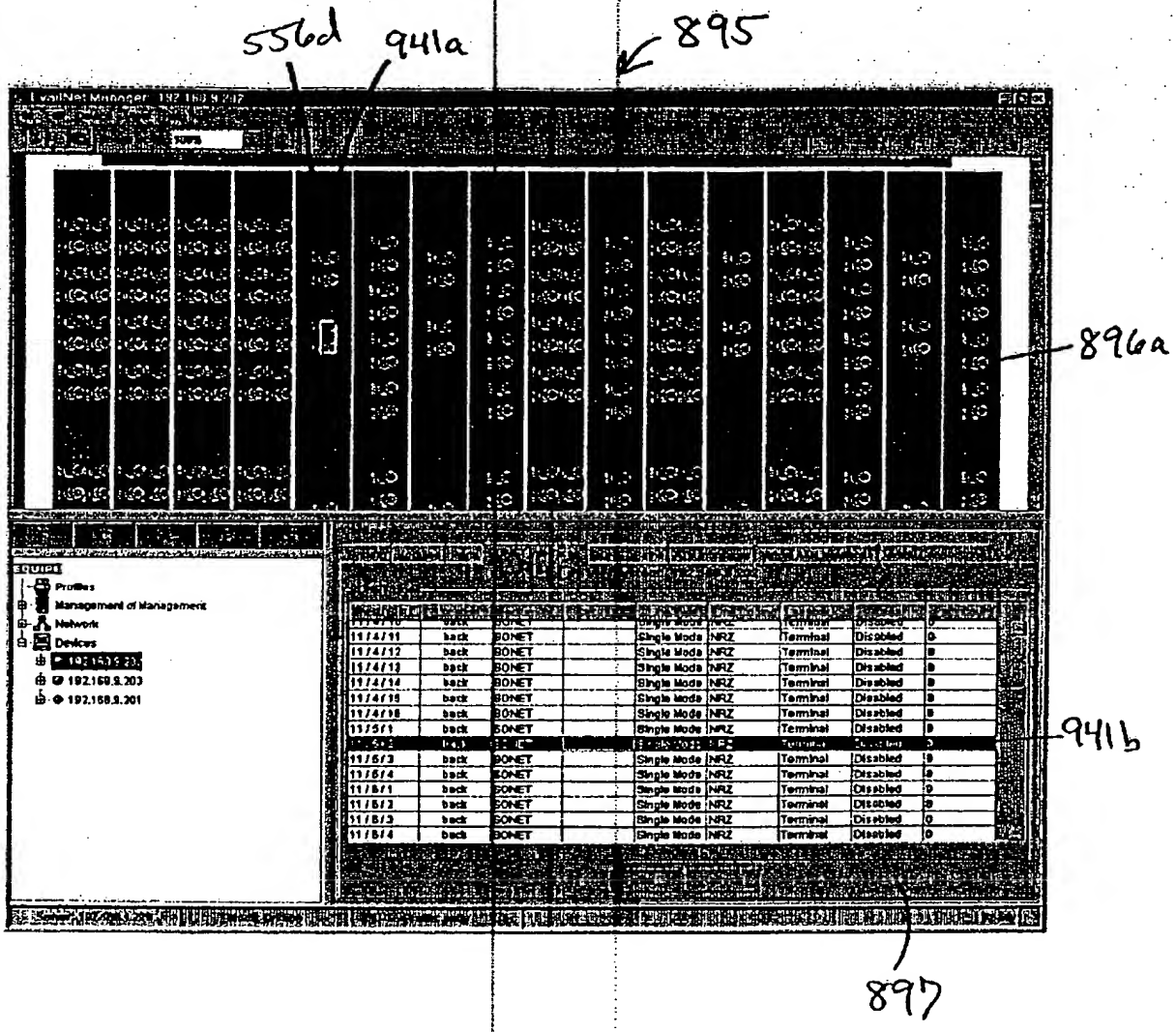

556d
941a
895
896a
941b
897
EQUIPE
Profiles
Management of Management
Network
Devices
192.168.9.203
192.168.9.201

Fig. 4v

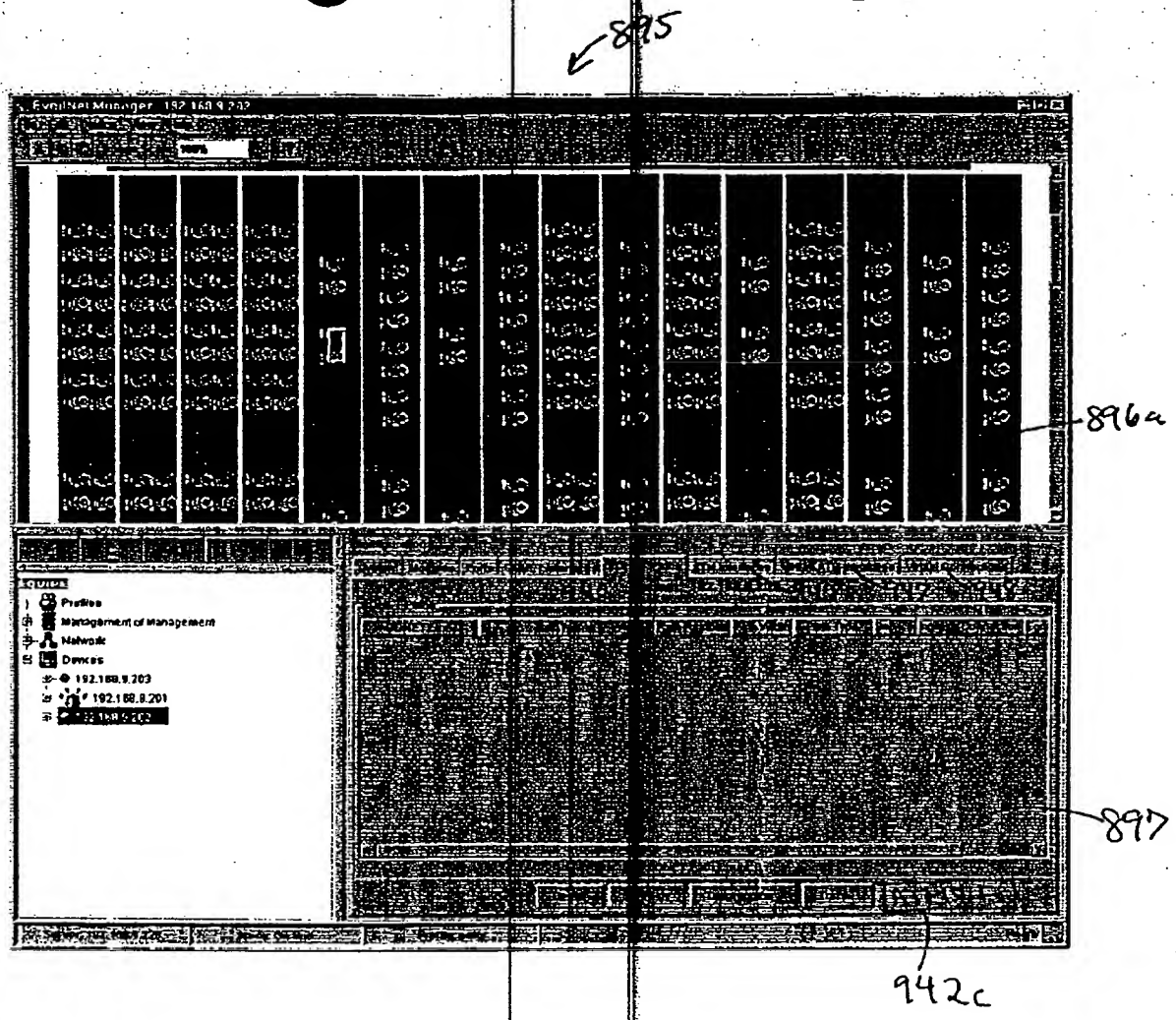


Fig. 4W

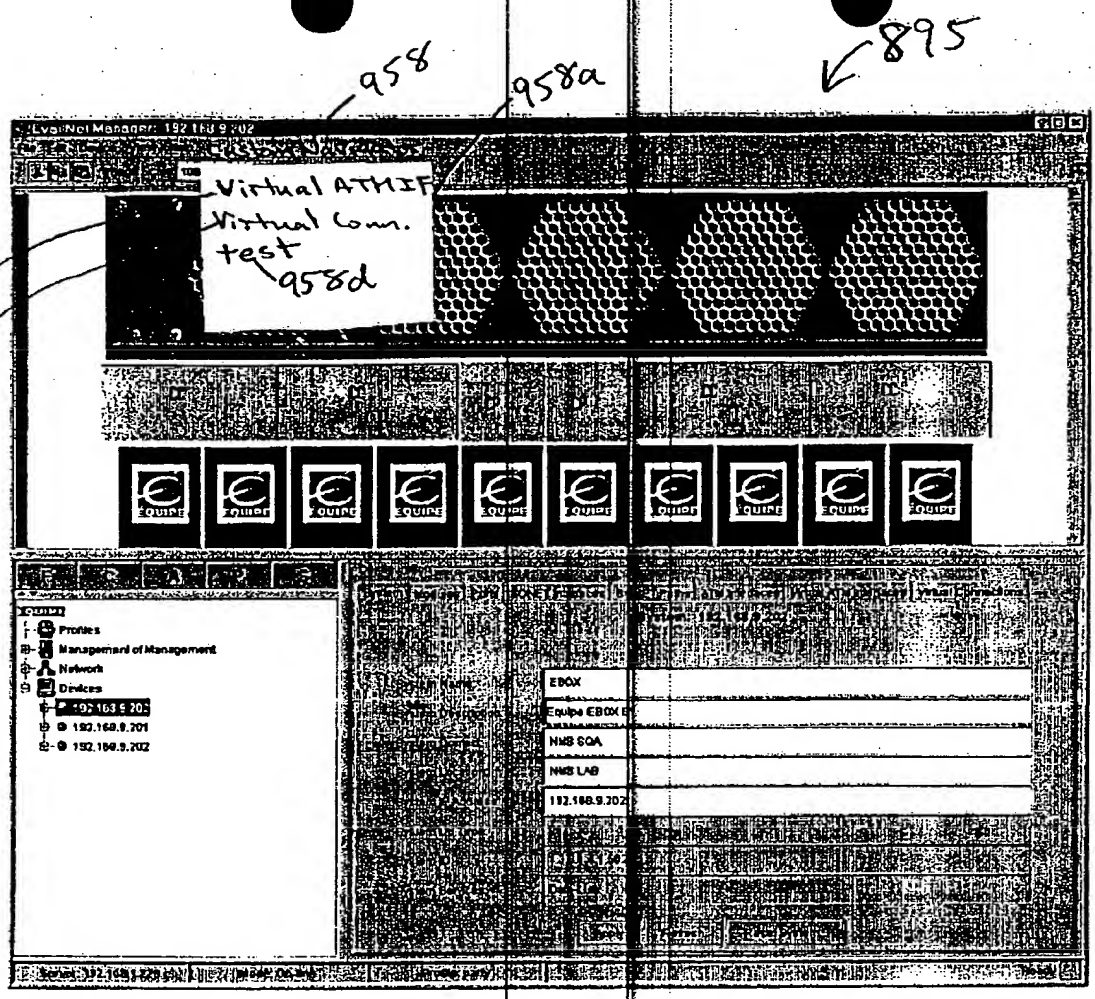

958
958a
895
Virtual ATHIF
Virtual Com.
test
958d
958b
958c
EQUIPE
Profiles
Management of Management
Network
Devices
192.168.9.201
192.168.9.202
EBOX
NMS SQA
NMS LAB
192.168.9.202

Fig. 4X

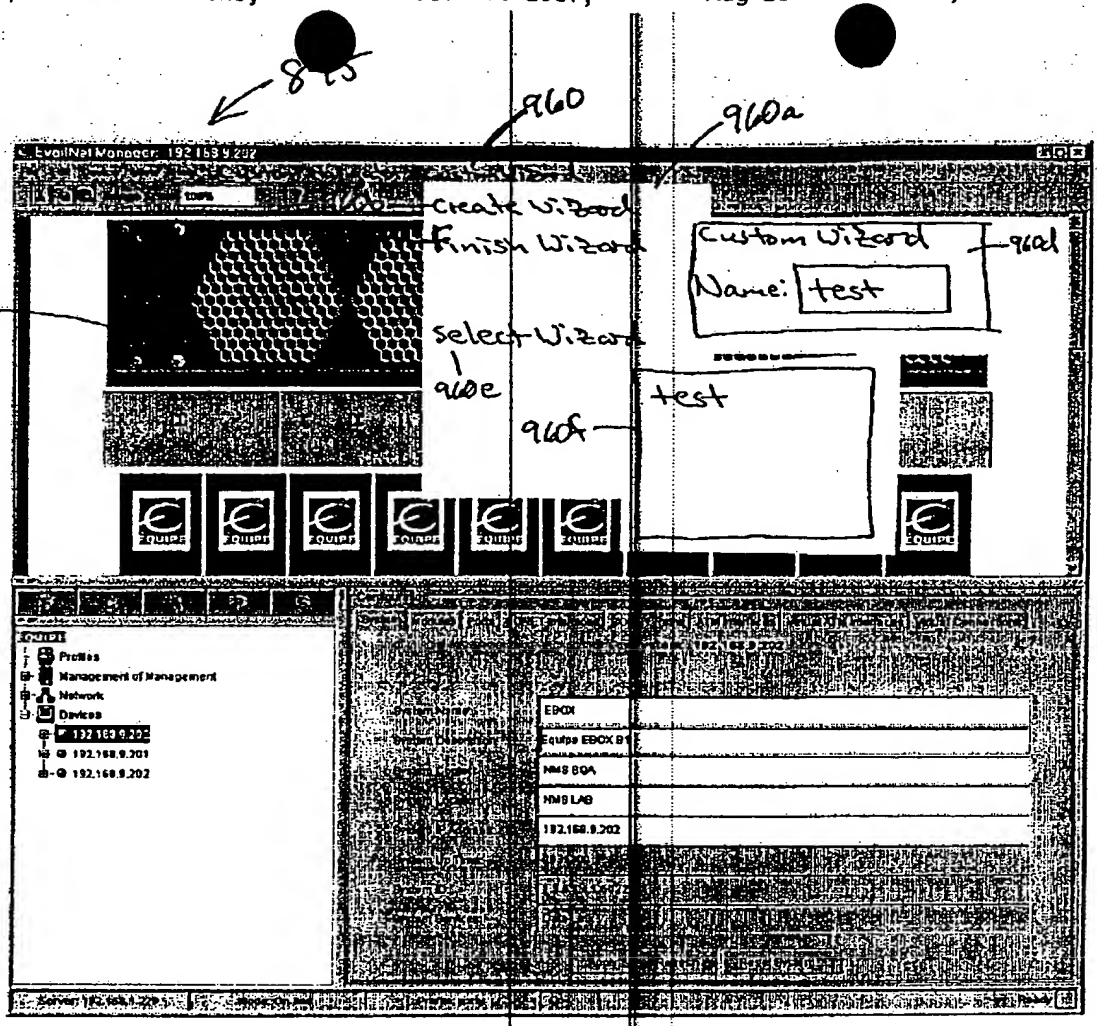

875
960
960a
Create Wizard
Finish Wizard
Custom Wizard
960d
Name: test
896a
Select Wizard
960e
960f
test
Profiles
Management of Management
Network
Devices
EPOX
Equipe EBOX B1
NMS BQA
NMS LAB
192.168.9.202

Fig. 4y

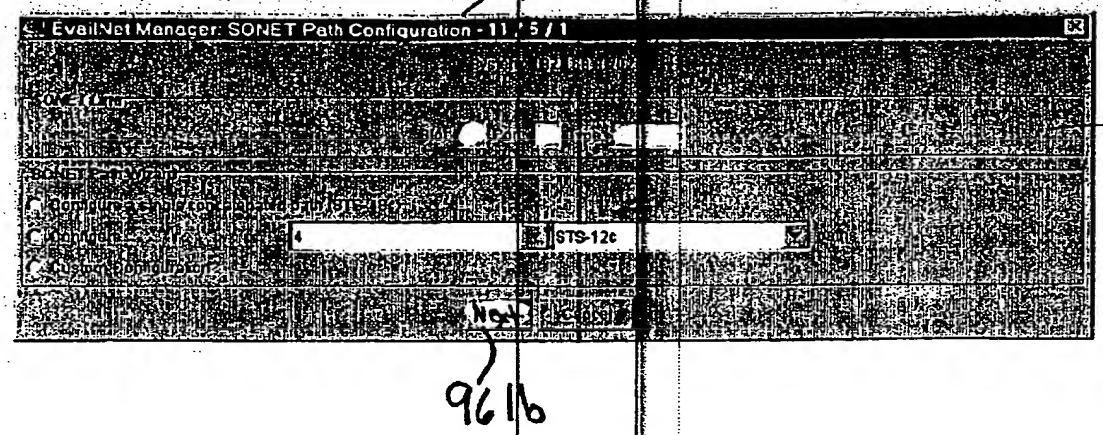

961
EvailNet Manager: SONET Path Configuration - 11 / 5 / 1
961a
4
STS-12c
961b

Fig. 42

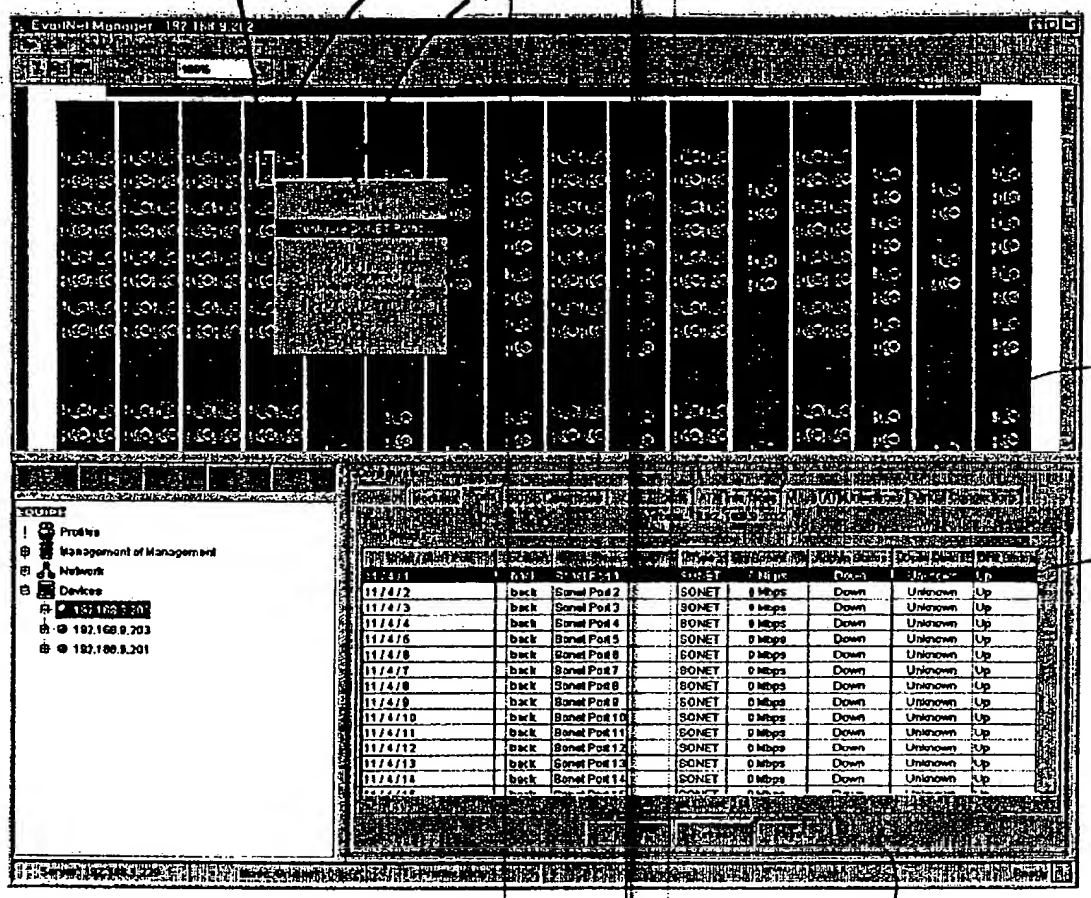


Fig. 5a

Fig. 5b

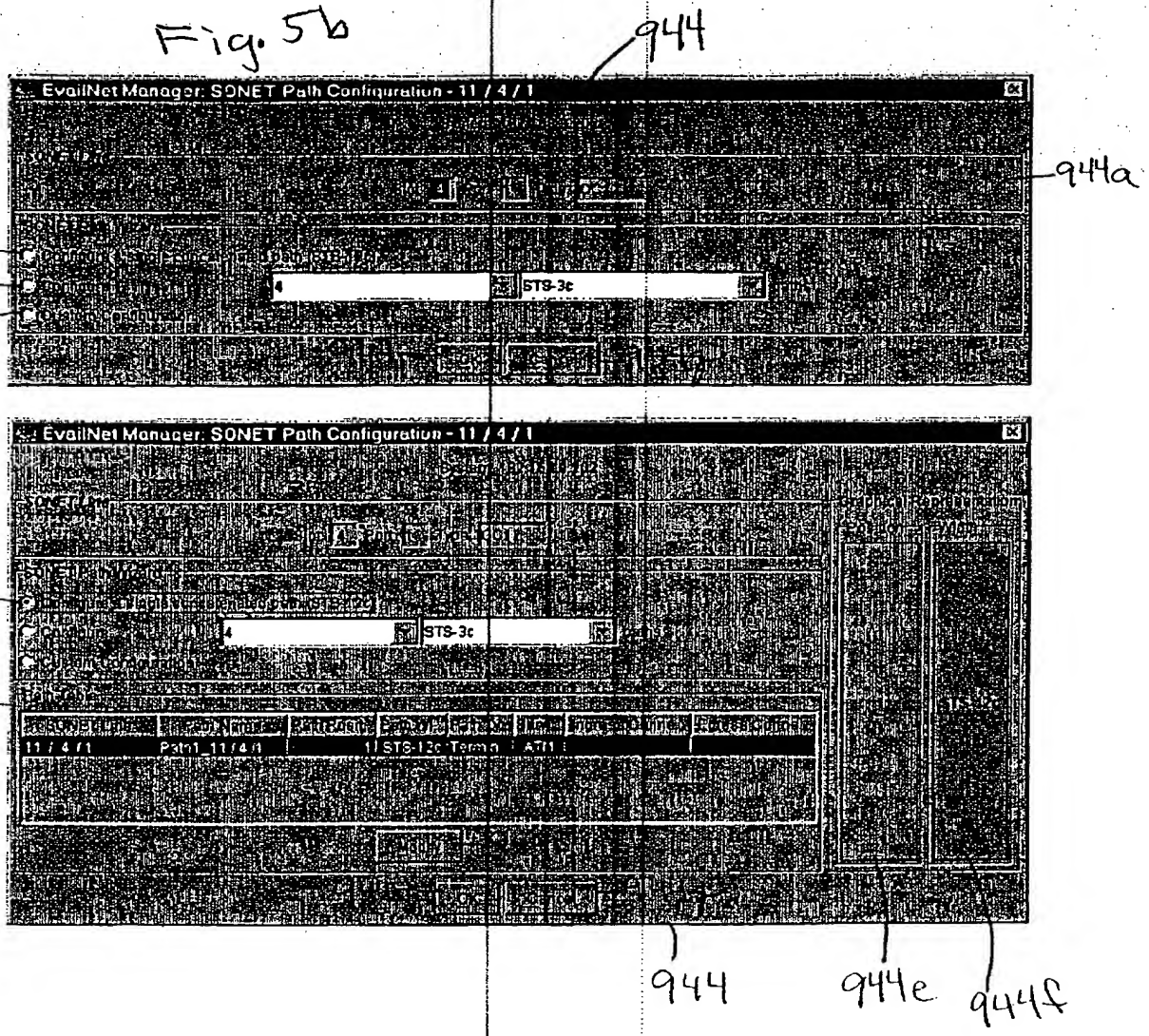
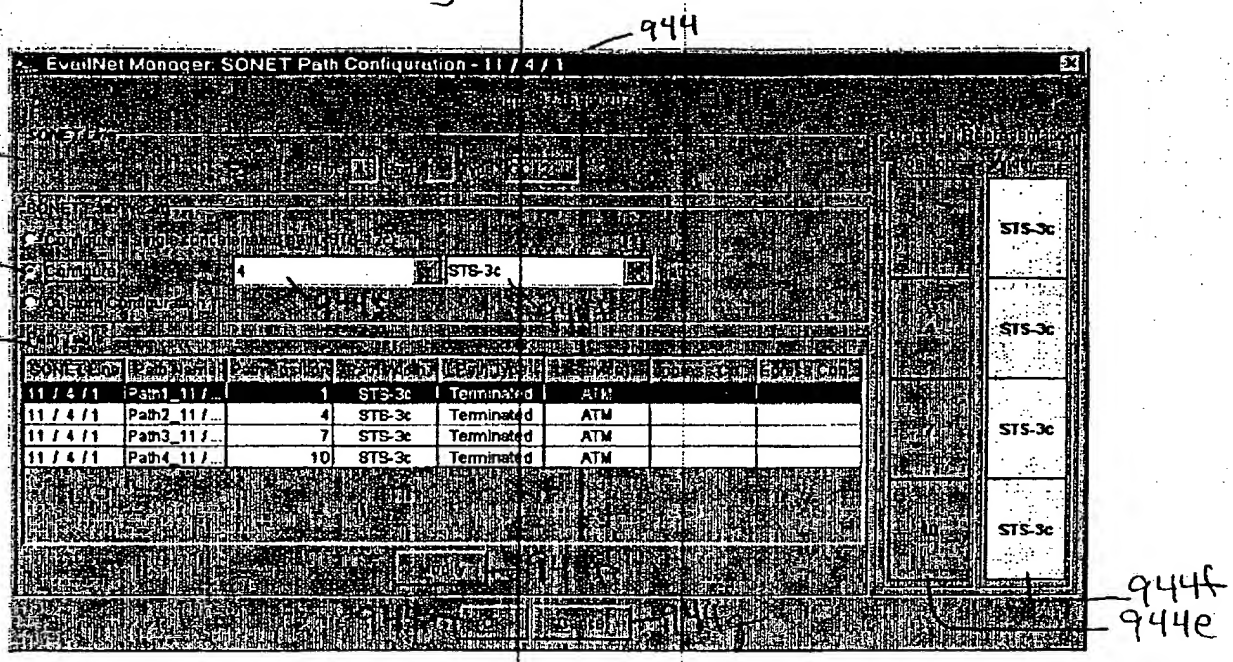

944
EvailNet Manager: SONET Path Configuration - 11 / 4 / 1
944a
944b
944c
944d
STS-3c
EvailNet Manager: SONET Path Configuration - 11 / 4 / 1
944b
STS-3c
944g
944
944e
944f

Fig. 5c

Fig. 5d


944
944a
944c
944g
944f
944e
EvanNet Manager: SONET Path Configuration - 11 / 4 / 1
STS-3c
STS-3c
STS-3c
STS-3c
11 / 4 / 1 Path1_11 /... 1 STS-3c Terminated ATM
11 / 4 / 1 Path2_11 /... 4 STS-3c Terminated ATM
11 / 4 / 1 Path3_11 /... 7 STS-3c Terminated ATM
11 / 4 / 1 Path4_11 /... 10 STS-3c Terminated ATM

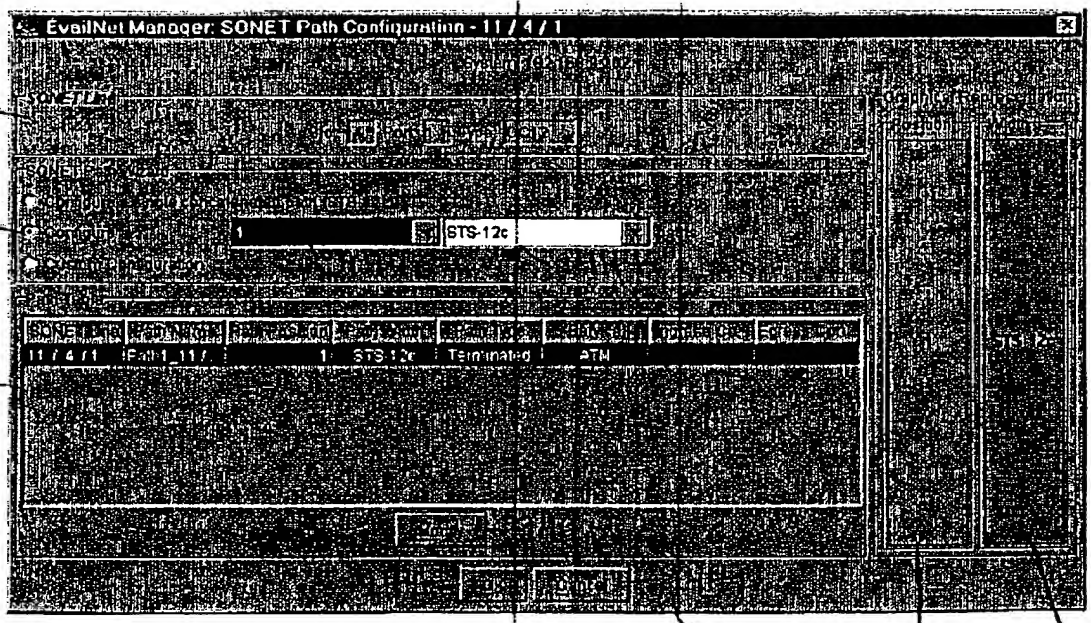
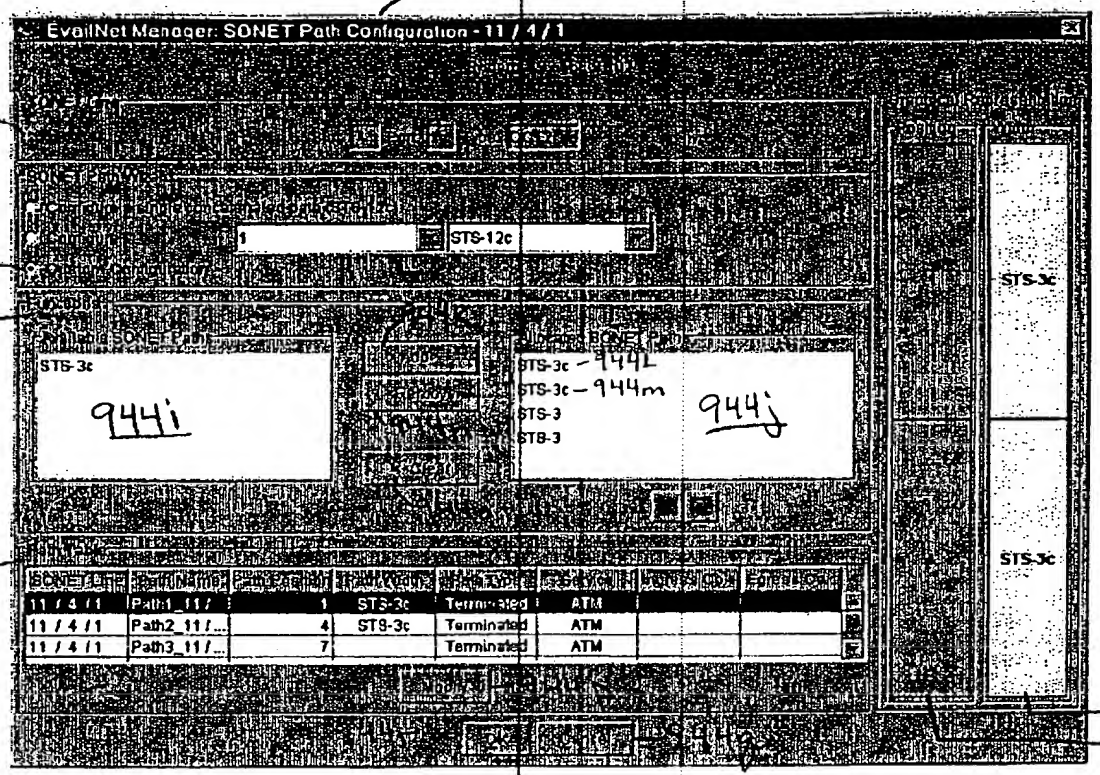

EvanNet Manager: SONET Path Configuration - 11 / 4 / 1
944a
944c
944g
STS-12c
11 / 4 / 1 Path1_11 / 1 STS-12c Terminated ATM
944
944e
944f

Fig. 5e

Fig. 5f


944
EvailNet Manager: SONET Path Configuration - 11 / 4 / 1
944a
944d
944h
STS-12c
STS-3c
STS-3c
944i
STS-3c – 944l
STS-3c – 944m
STS-3
STS-3
944j
944g
11 / 4 / 1 Path1_11 / 1 STS-3c Terminated ATM
11 / 4 / 1 Path2_11 / ... 4 STS-3c Terminated ATM
11 / 4 / 1 Path3_11 / ... 7 Terminated ATM
944f
944e

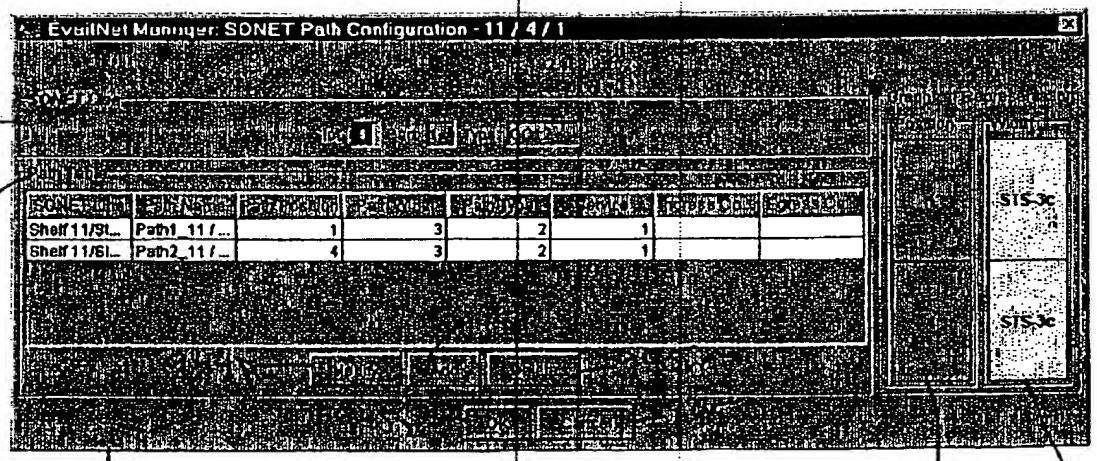

EvailNet Manager: SONET Path Configuration - 11 / 4 / 1
945a
945g
Shelf 11/St... Path1_11 / ... 1 3 2 1
Shelf 11/Sl... Path2_11 / ... 4 3 2 1
STS-3c
STS-3c
945
945e
945f

Fig. 5g

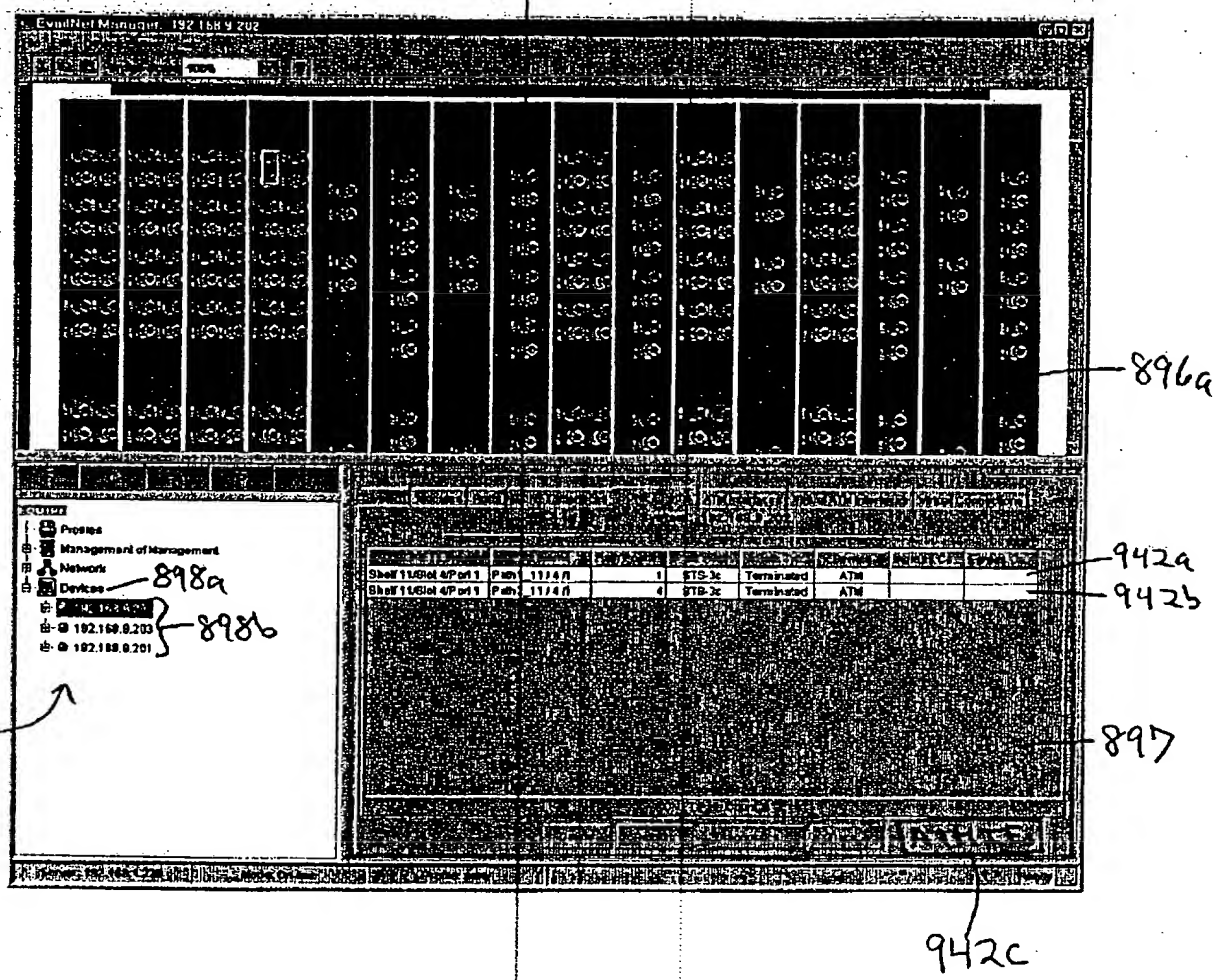


Fig. 5h

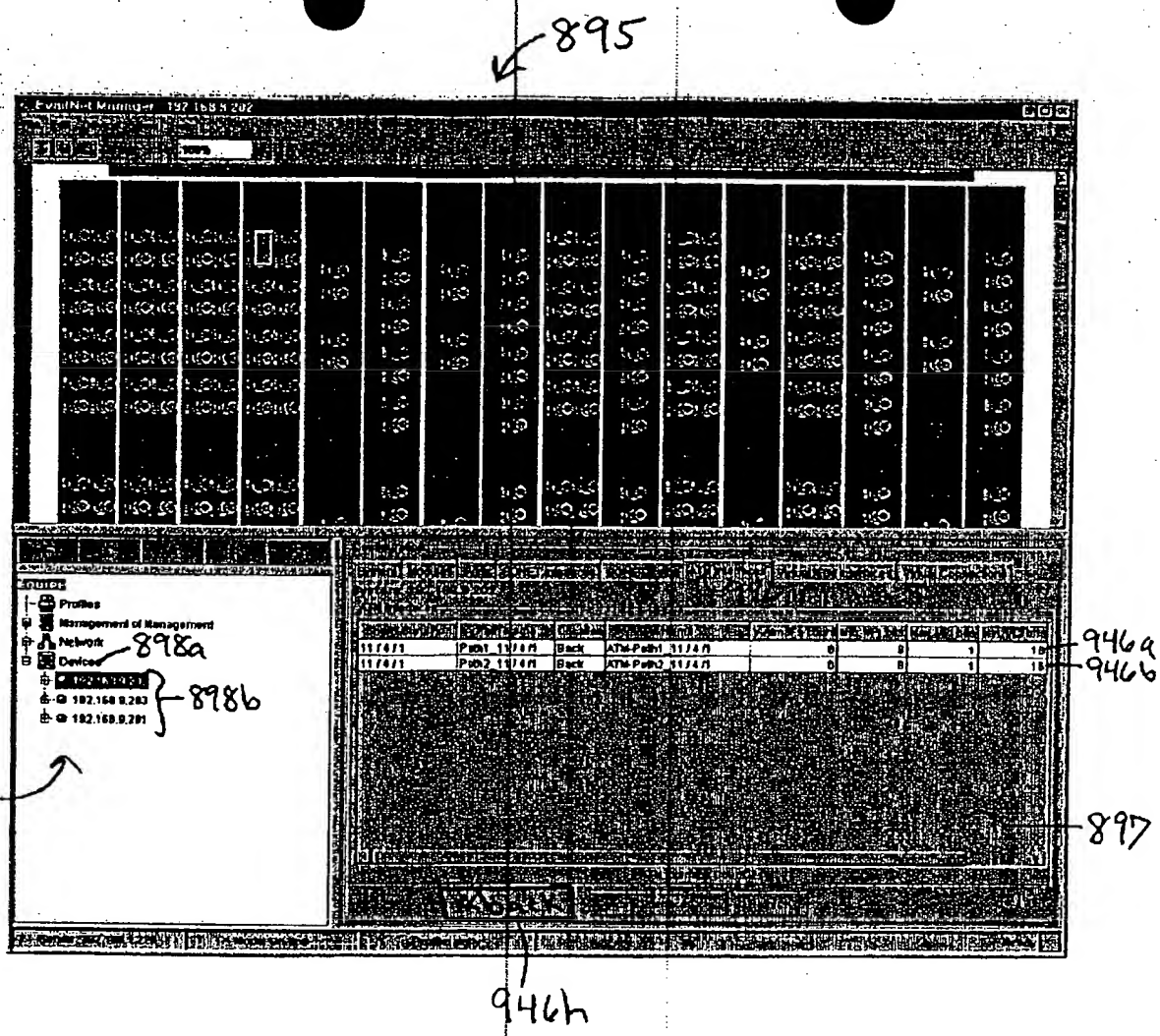


Fig. 5i

Fig. 5J

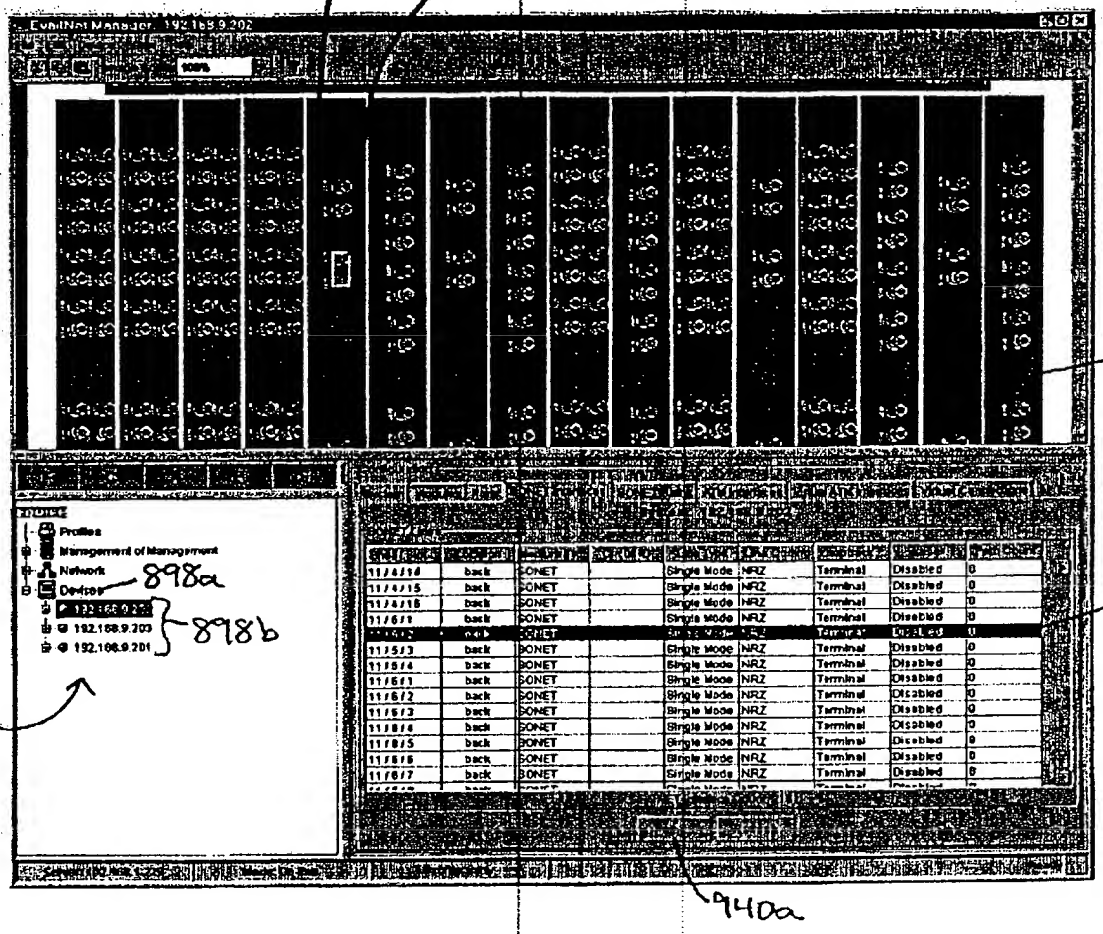

556d
941a
895
896a
898
898a
898b
949a
940a

Fig. 5K

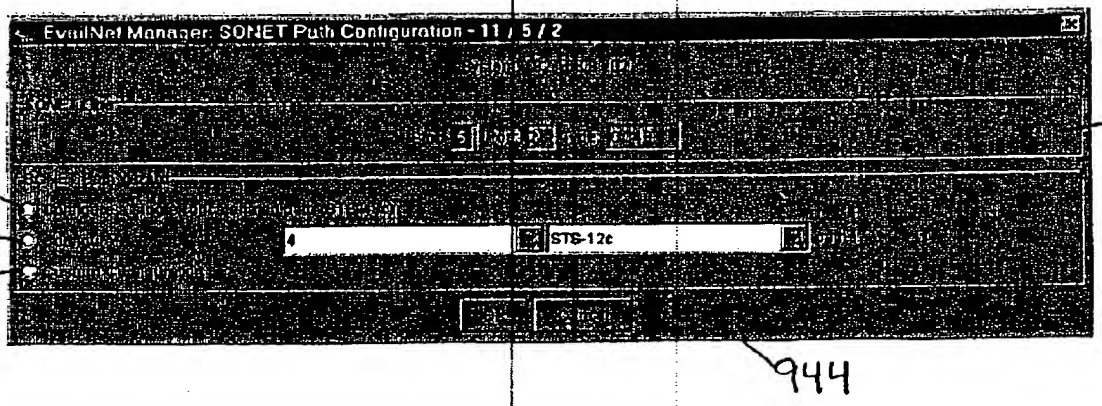

EvaliNet Manager: SONET Path Configuration - 11 / 5 / 2
944a
944b
944c
944d
STS-12c
944

Fig. 5l

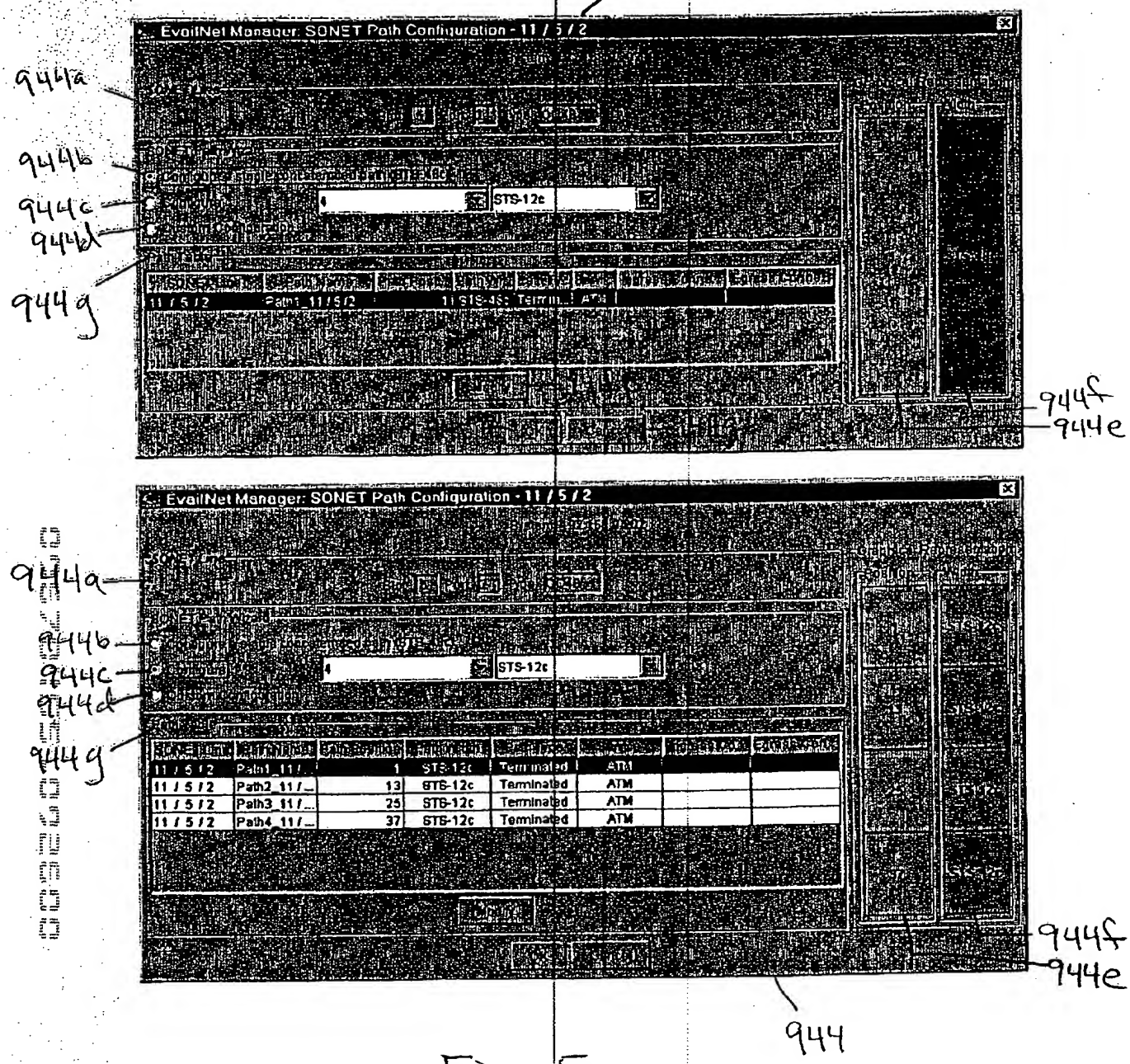
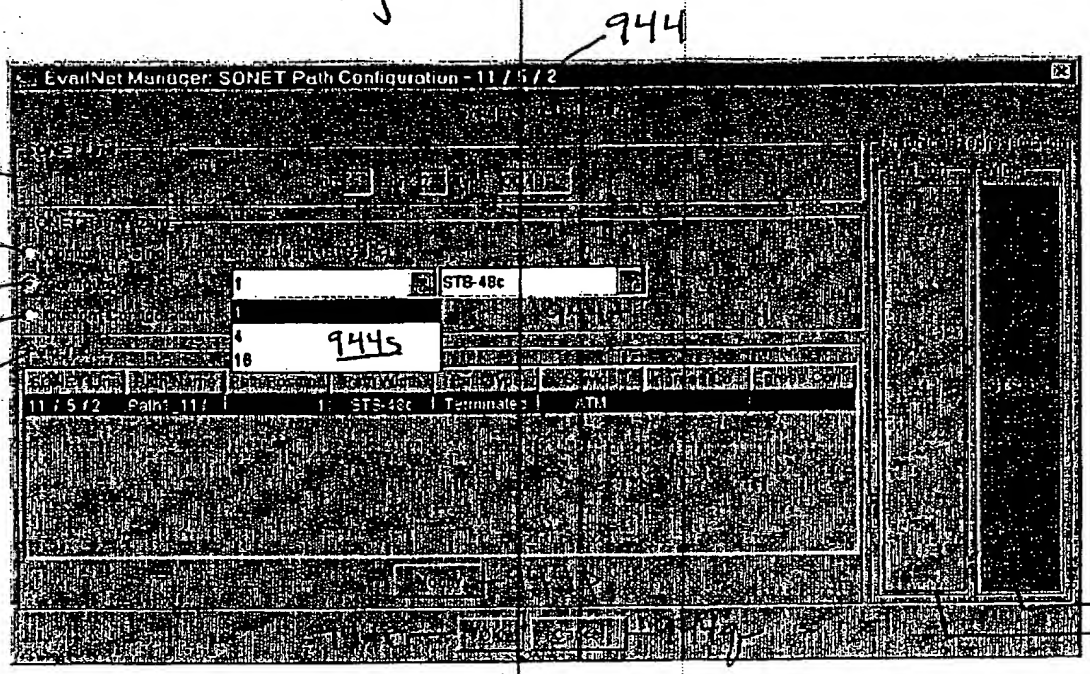

944
EvailNet Manager: SONET Path Configuration - 11 / 5 / 2
944a
944b
944c
944d
944g
STS-12c
944f
944e
EvailNet Manager: SONET Path Configuration - 11 / 5 / 2
944a
944b
944c
944d
944g
STS-12c
11 / 5 / 2 Path1_11/... 1 STS-12c Terminated ATM
11 / 5 / 2 Path2_11/... 13 STS-12c Terminated ATM
11 / 5 / 2 Path3_11/... 25 STS-12c Terminated ATM
11 / 5 / 2 Path4_11/... 37 STS-12c Terminated ATM
944f
944e
944

Fig. 5m

Fig. 5n


944
EvalNet Manager: SONET Path Configuration - 11 / 5 / 2
944a
944b
944c
944d
944g
STS-48c
944s
944f
944e

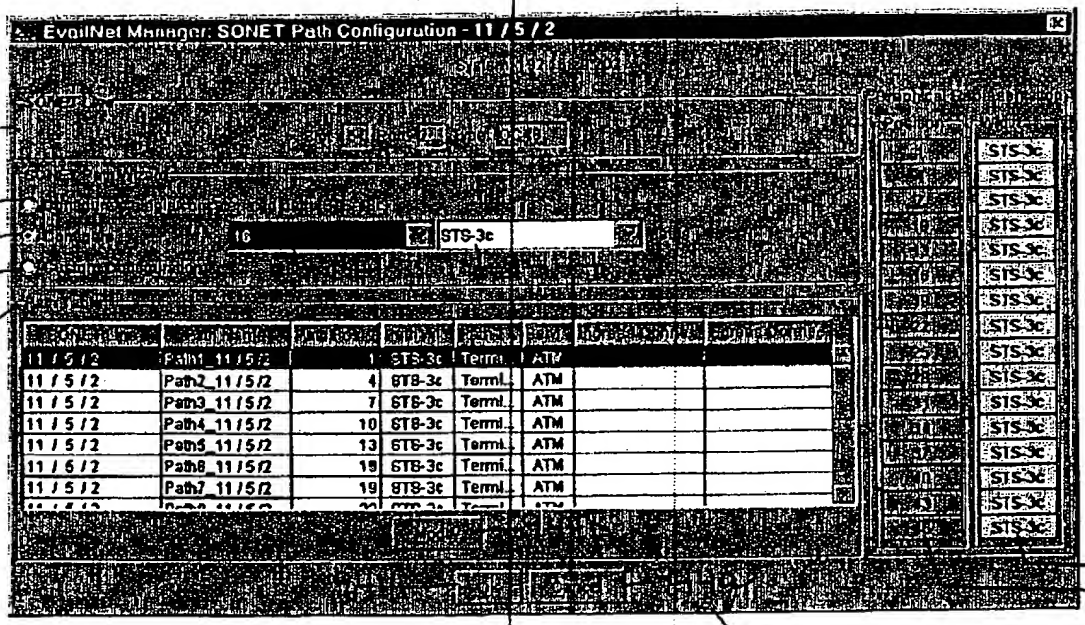

EvalNet Manager: SONET Path Configuration - 11 / 5 / 2
944a
944b
944c
944d
944g
STS-3c
11 / 5 / 2 Path1_11/5/2 1 STS-3c Termi... ATM
11 / 5 / 2 Path2_11/5/2 4 STS-3c Termi... ATM
11 / 5 / 2 Path3_11/5/2 7 STS-3c Termi... ATM
11 / 5 / 2 Path4_11/5/2 10 STS-3c Termi... ATM
11 / 5 / 2 Path5_11/5/2 13 STS-3c Termi... ATM
11 / 5 / 2 Path6_11/5/2 16 STS-3c Termi... ATM
11 / 5 / 2 Path7_11/5/2 19 STS-3c Termi... ATM
944f
944e
944

Fig. 5o

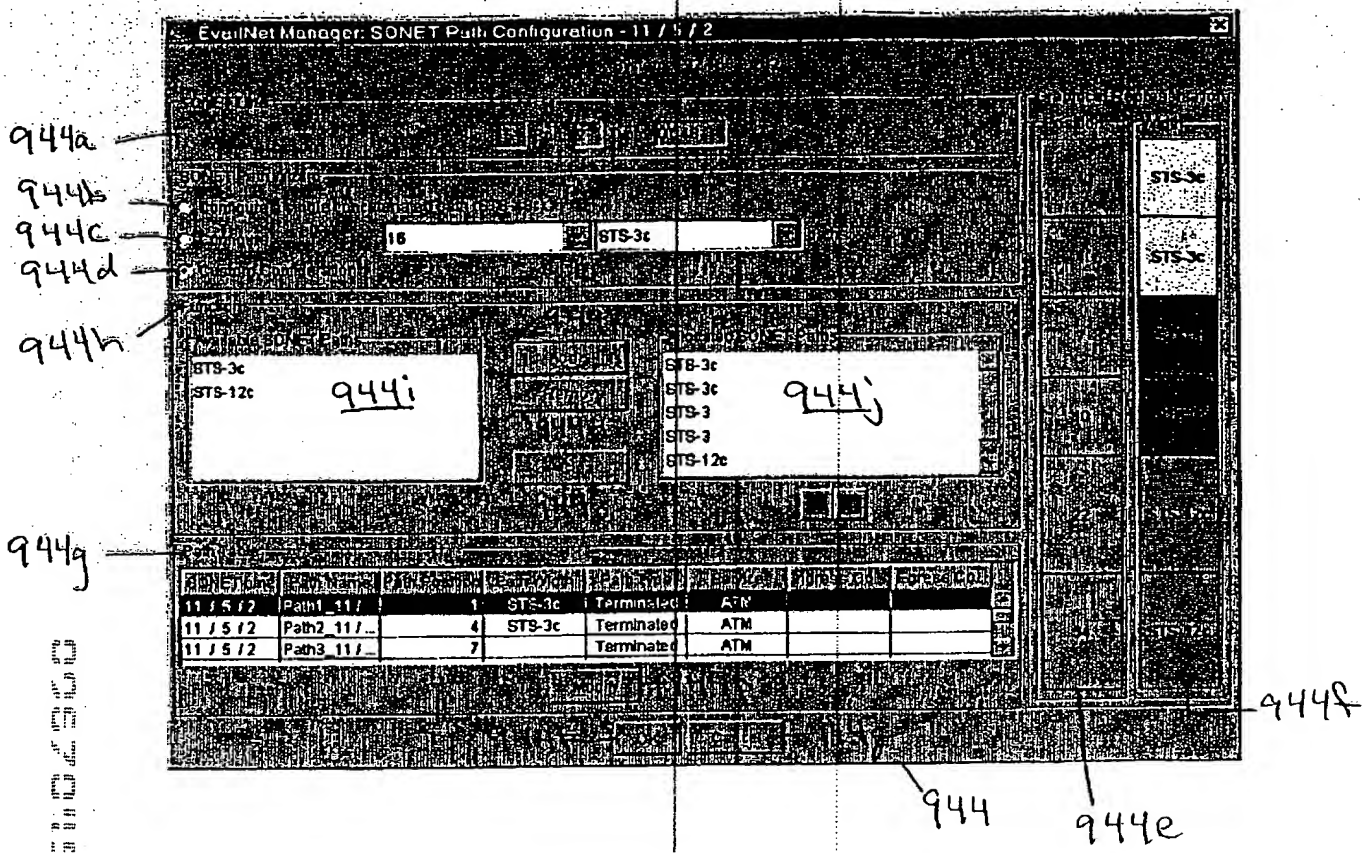

EvalNet Manager: SONET Path Configuration - 11 / 5 / 2
944a
944b
944c
944d
944h
944i
944j
944g
944f
944
944e
STS-3c
STS-12c
STS-3
Path1_11 /
Path2_11 /...
Path3_11 /...
Terminated
ATM

Fig. 5P

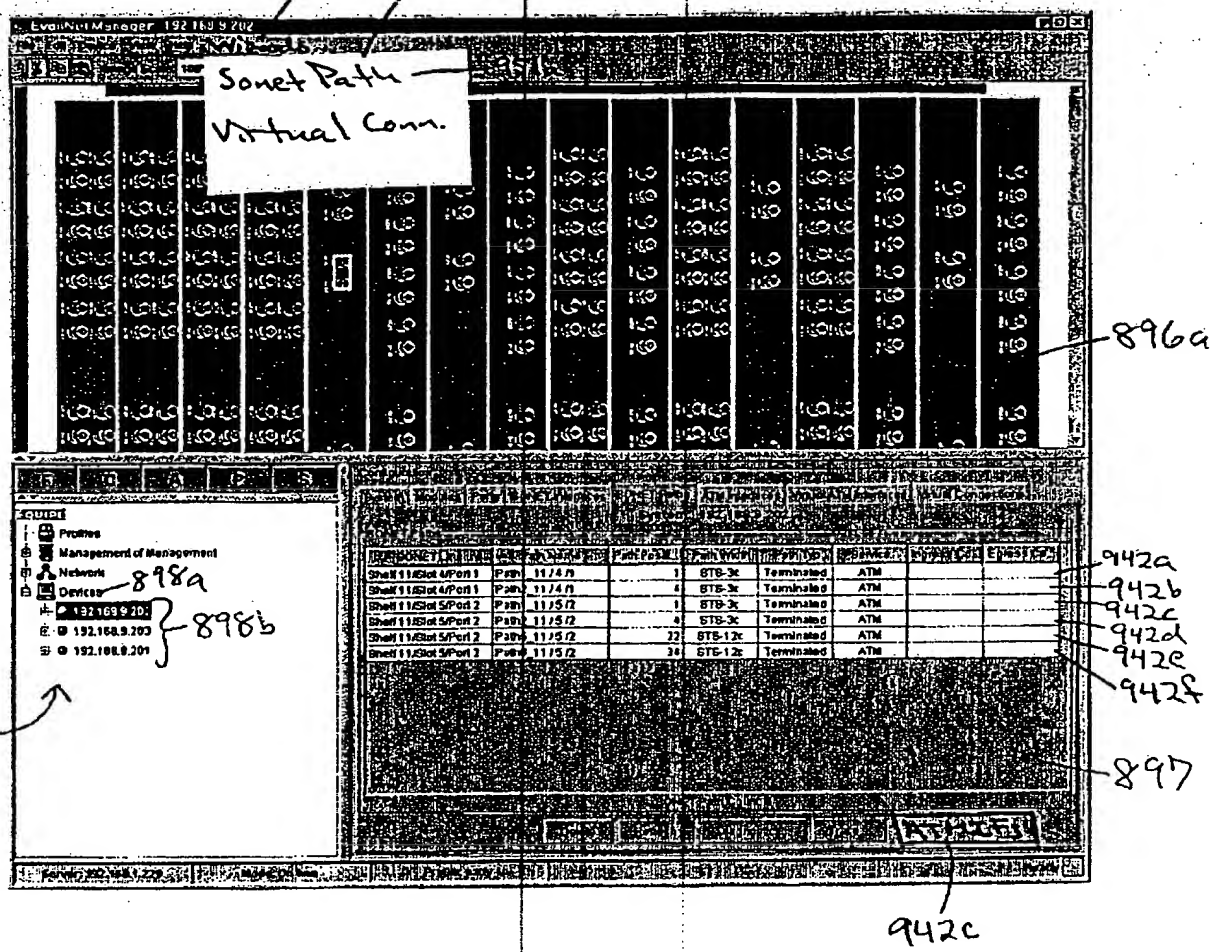

895
951
951b
Sonet Path
Virtual Conn.
896a
898
898a
898b
942a
942b
942c
942d
942e
942f
897
942c

Fig. 5g

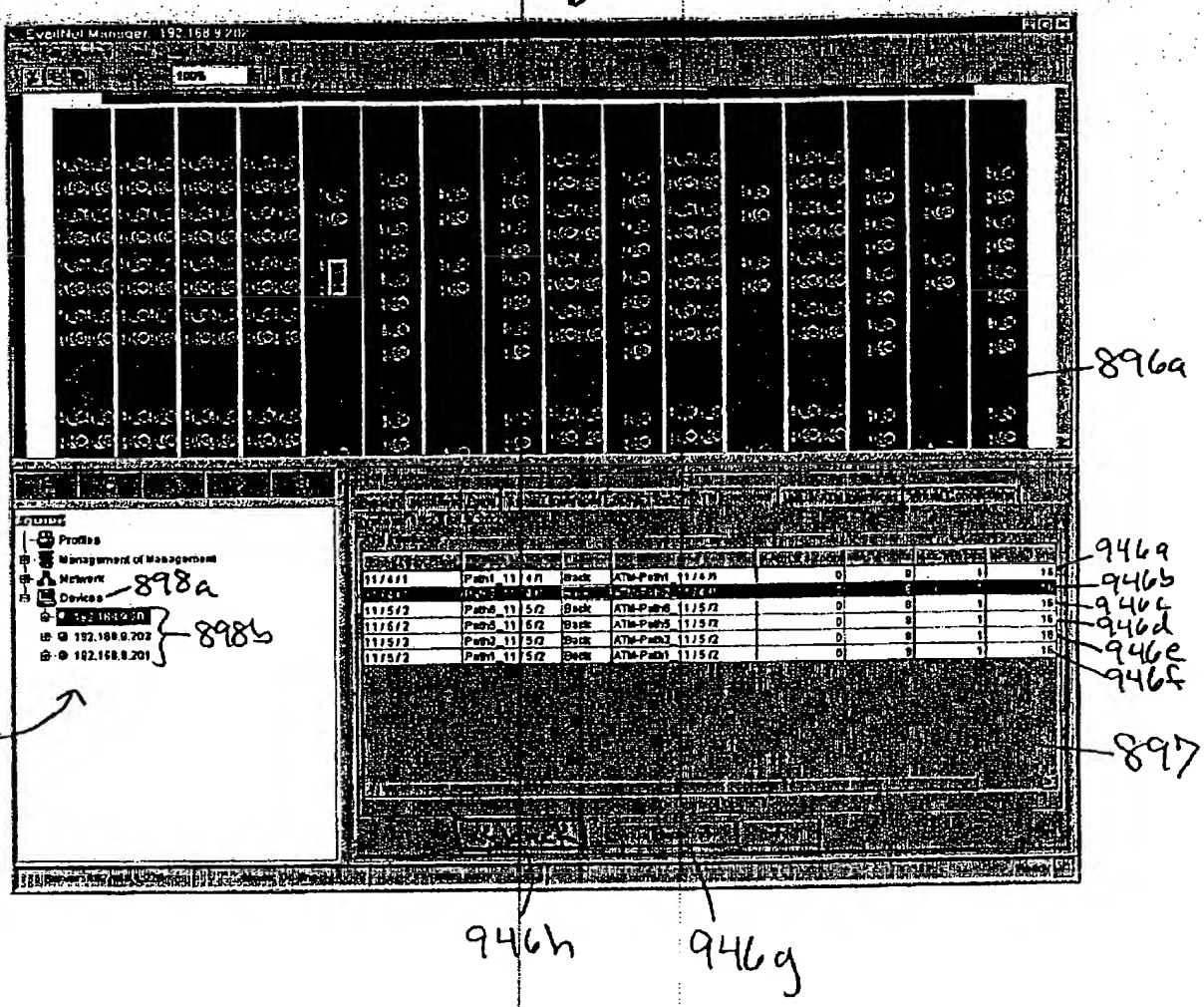

895
896a
946a
946b
946c
946d
946e
946f
898a
898b
898
897
946h
946g

Fig. 5F

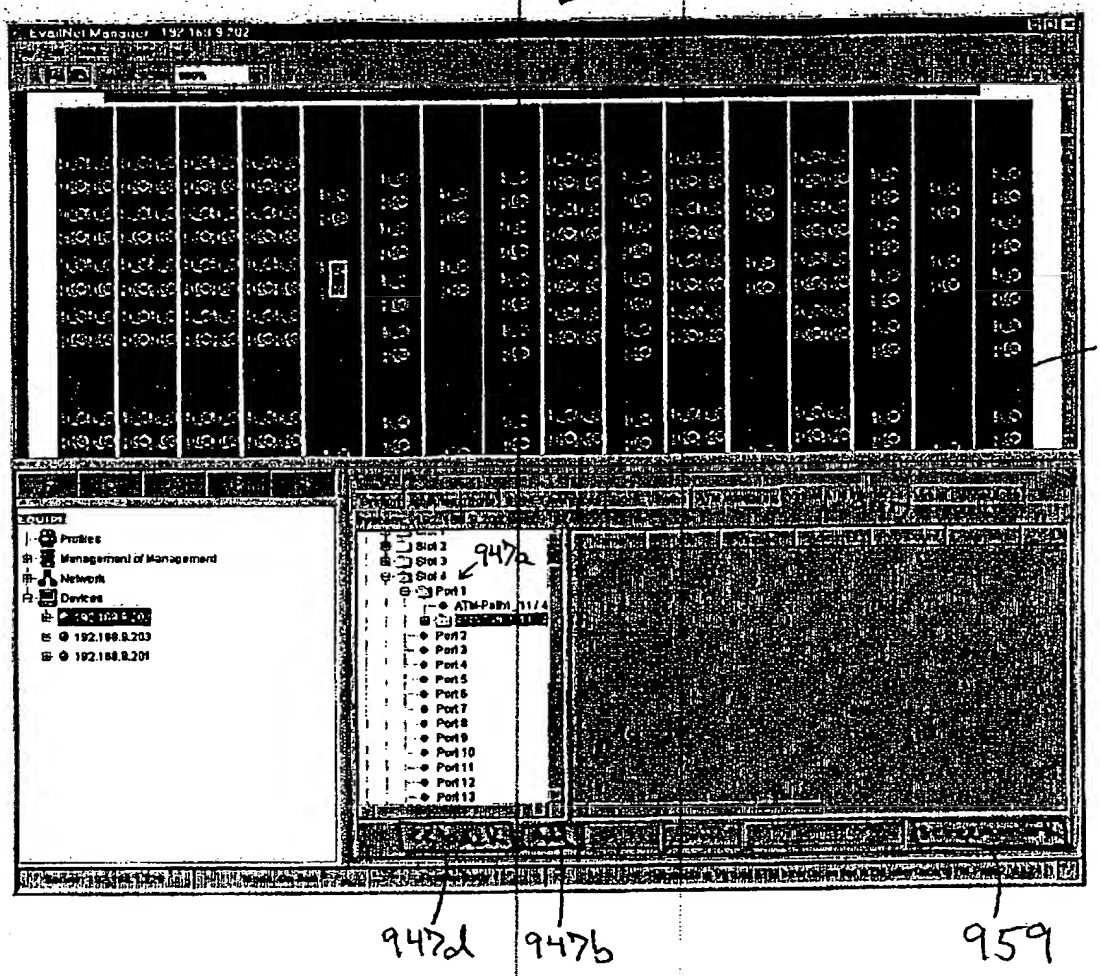
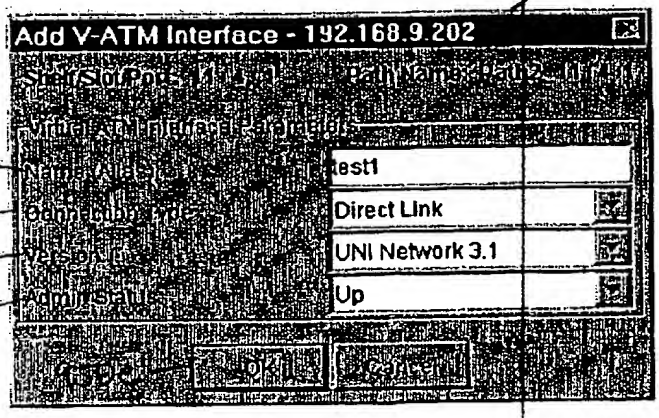

895
896a
947a
947b
947c
959
Profiles
Management of Management
Network
Devices
192.168.9.203
192.168.9.201
Slot 2
Slot 3
Slot 4
Port 1
Port 2
Port 3
Port 4
Port 5
Port 6
Port 7
Port 8
Port 9
Port 10
Port 11
Port 12
Port 13

Fig. 5s

Fig. 5t


950
Add V-ATM Interface - 192.168.9.202
950d
test1
950a
Direct Link
950b
UNI Network 3.1
950c
Up

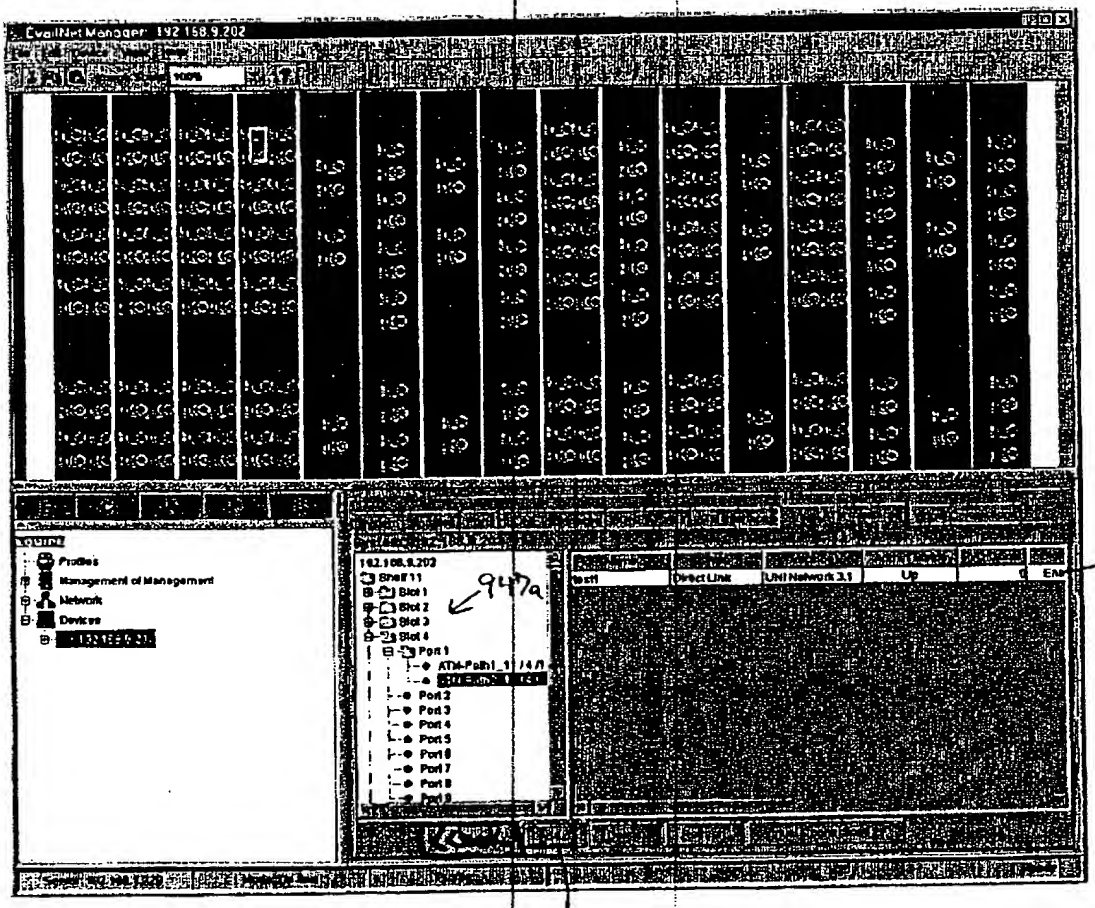

947a
947b
947c

Fig. 5u

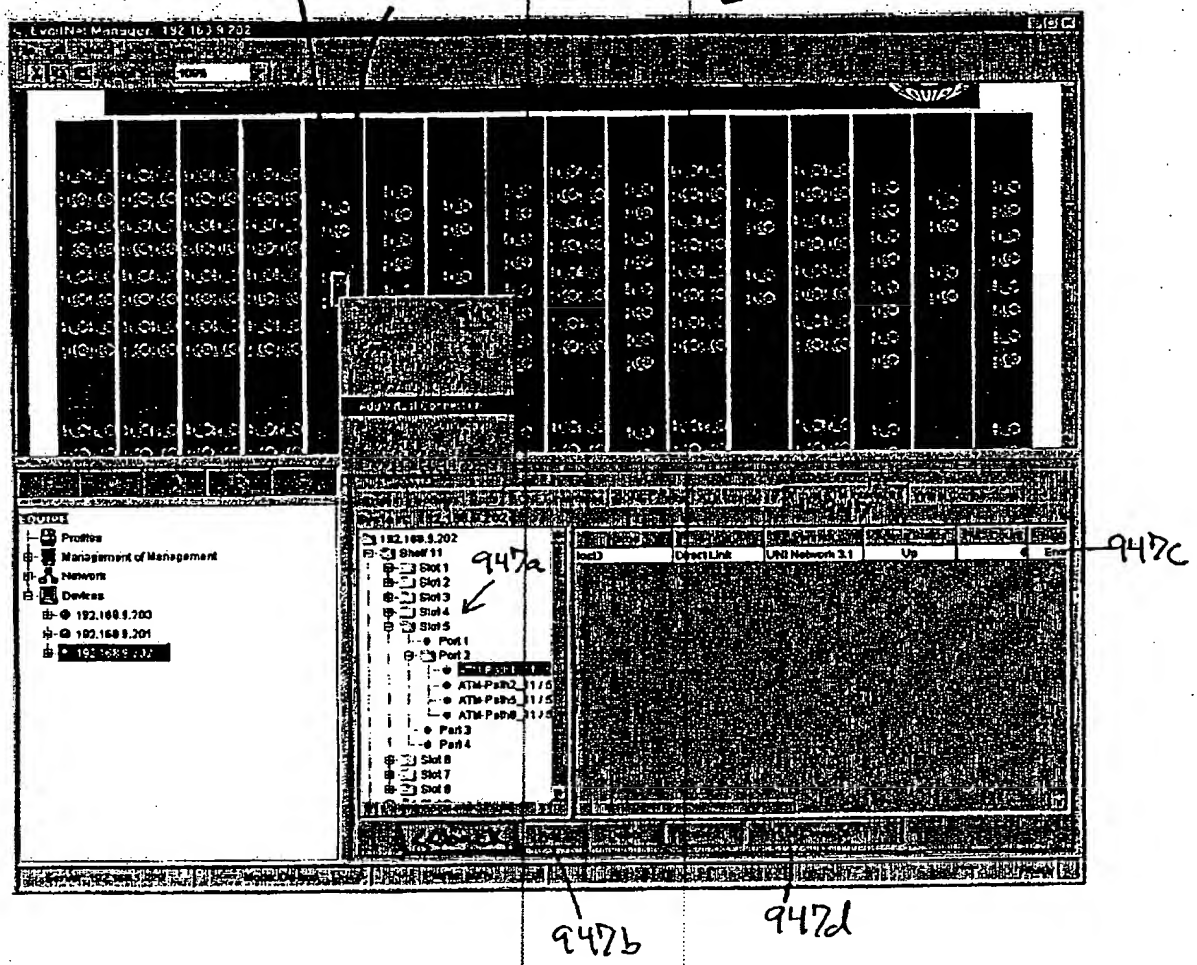


Fig. 5v

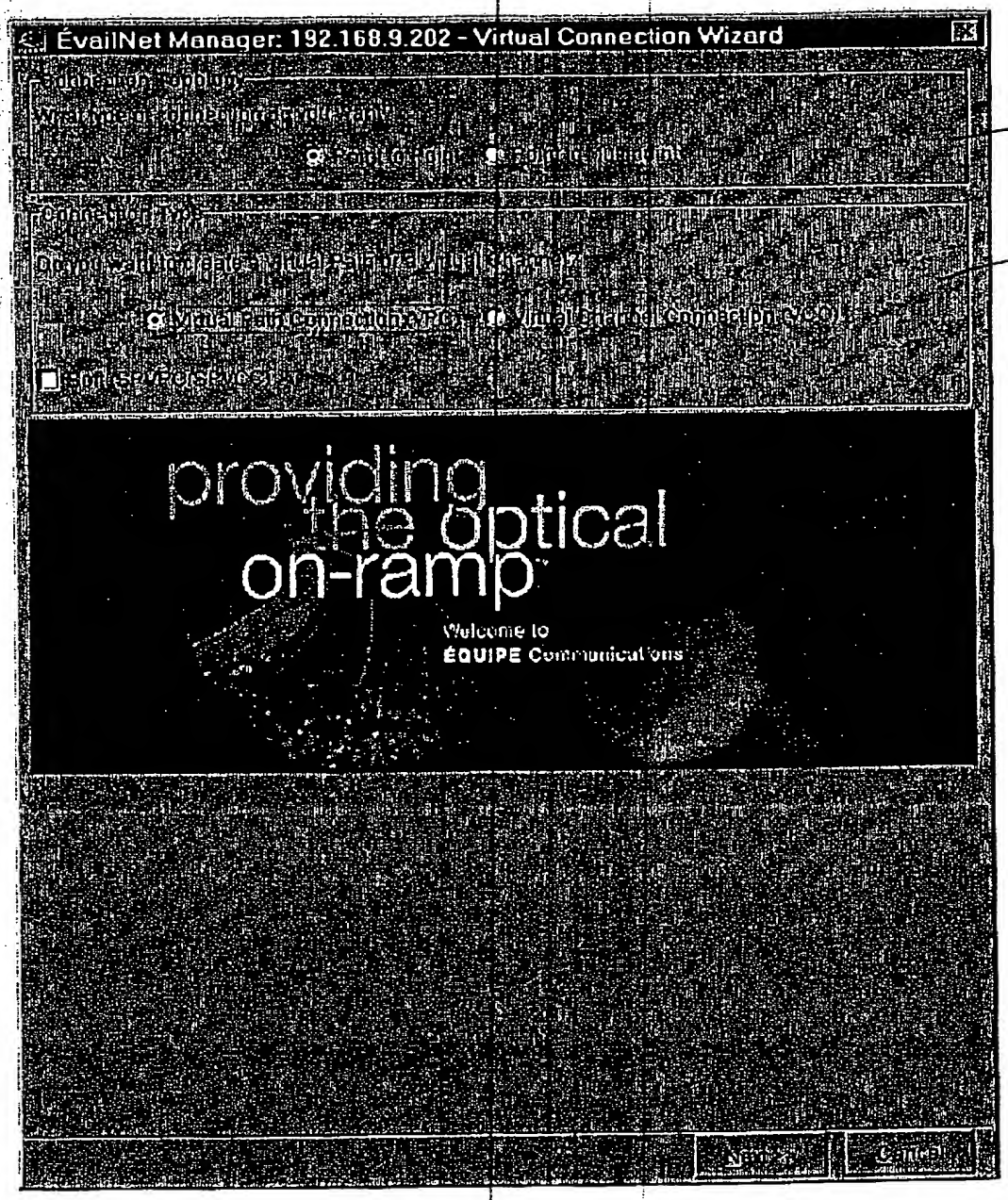

952
ÉvailNet Manager: 192.168.9.202 - Virtual Connection Wizard
952a
952b
providing the optical on-ramp
Welcome to
ÉQUIPE Communications

Fig. 5w

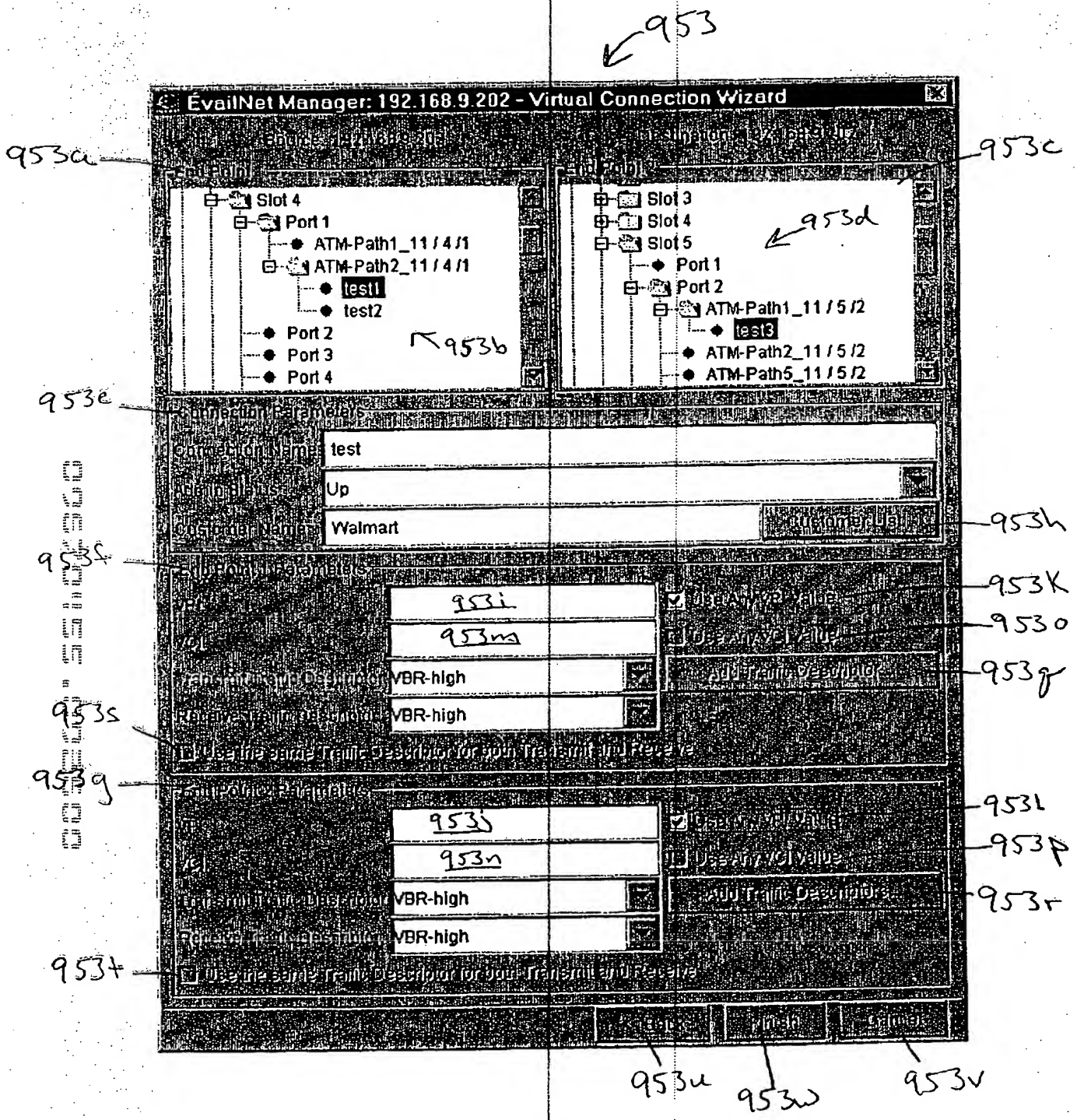

953
EvailNet Manager: 192.168.9.202 - Virtual Connection Wizard
953a
953c
Slot 4
Port 1
ATM-Path1_11 / 4 /1
ATM-Path2_11 / 4 /1
test1
test2
Port 2
Port 3
Port 4
953b
Slot 3
Slot 4
Slot 5
953d
Port 1
Port 2
ATM-Path1_11 / 5 /2
test3
ATM-Path2_11 / 5 /2
ATM-Path5_11 / 5 /2
953e
Connection Parameters
Connection Name:
test
Admin Status:
Up
Customer Name:
Walmart
Customer List
953h
953f
Port Parameters
953K
953i
953o
953m
VBR-high
VBR-high
953g
953s
Use the same Traffic Descriptor for both Transmit and Receive
953g
953l
953j
953p
953n
VBR-high
VBR-high
953r
953t
Use the same Traffic Descriptor for both Transmit and Receive
953u
953w
953v

Fig. 5x

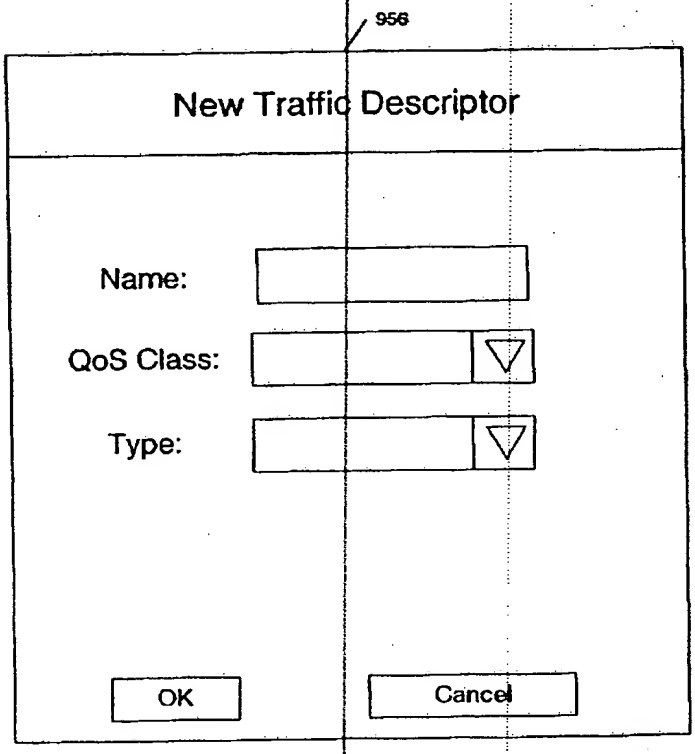


Fig. 5Y

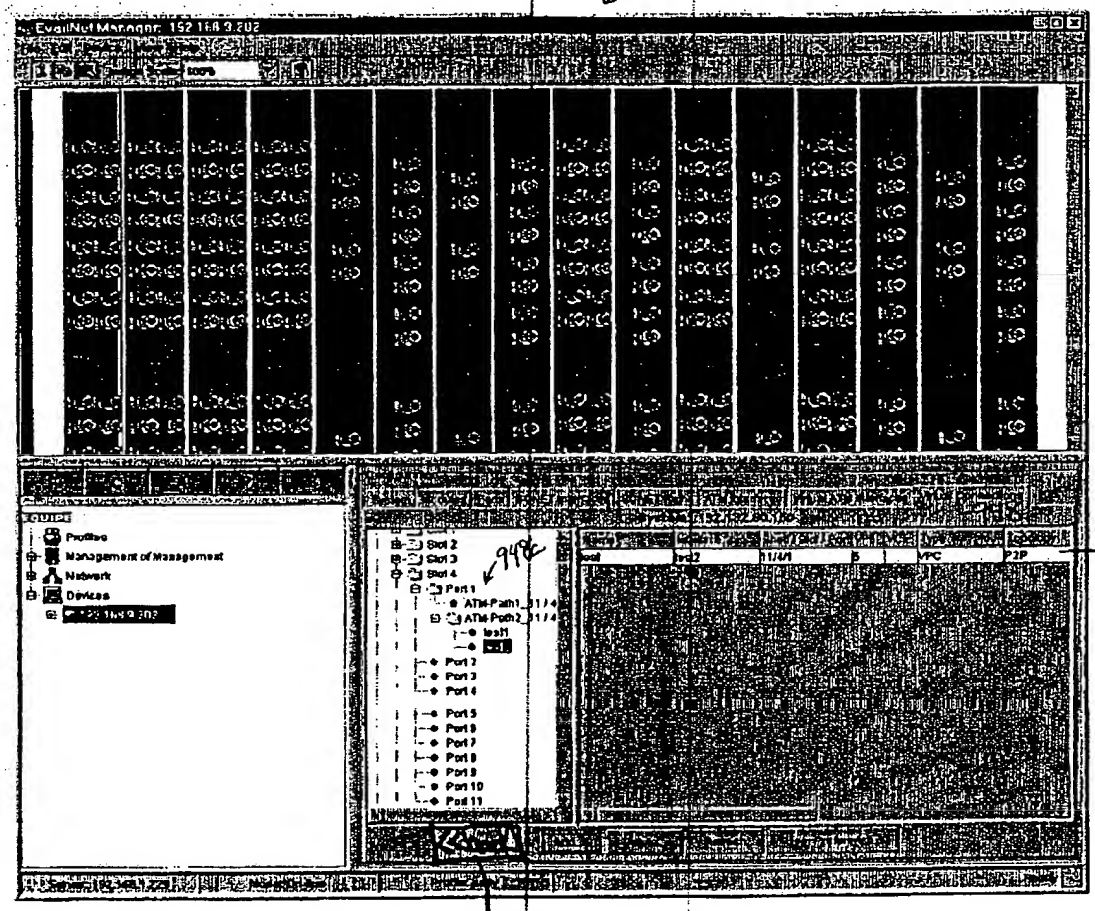


Fig. 57

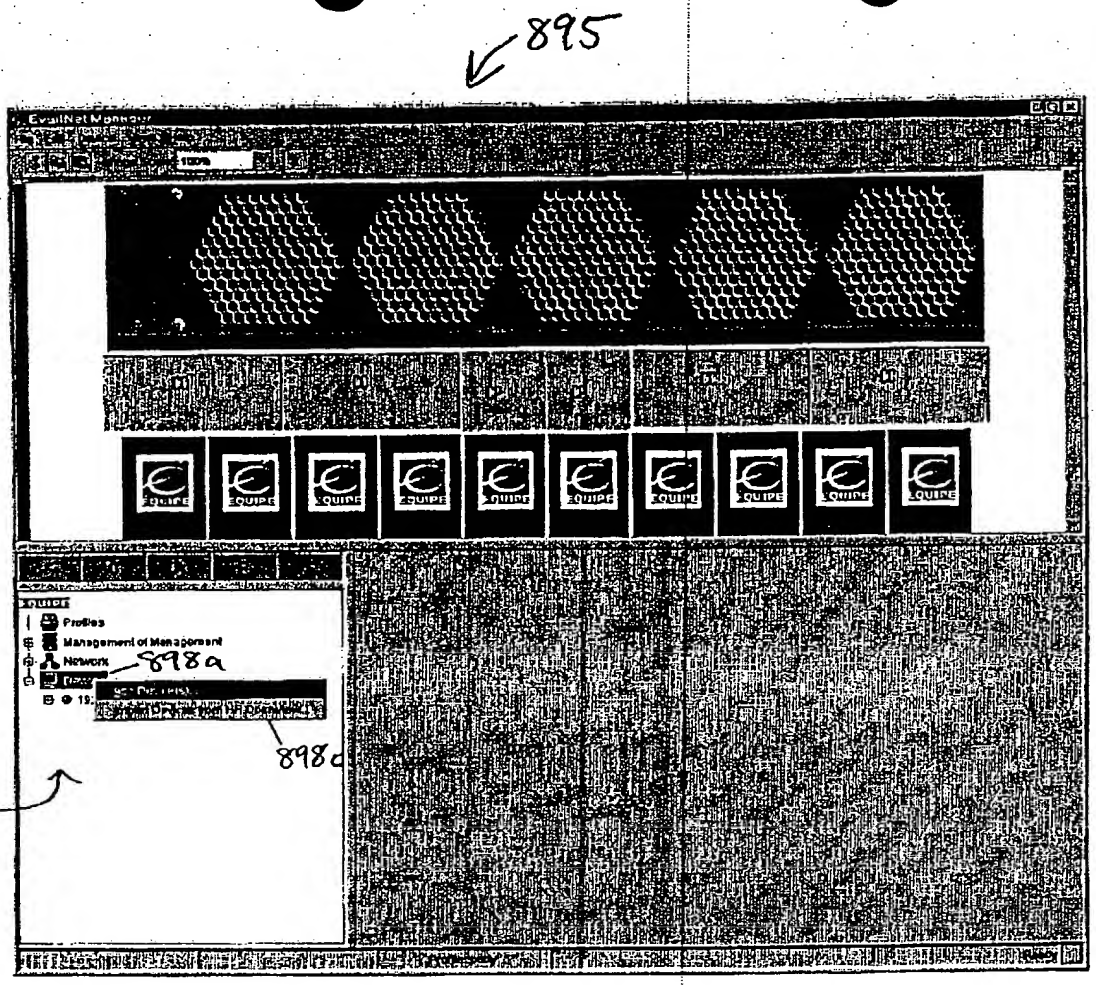


Fig. 6a

Fig. 6b

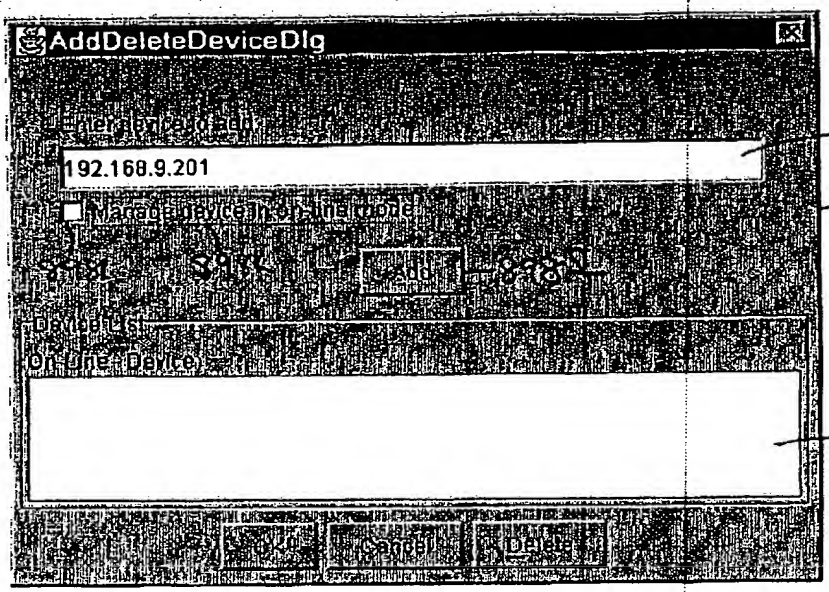
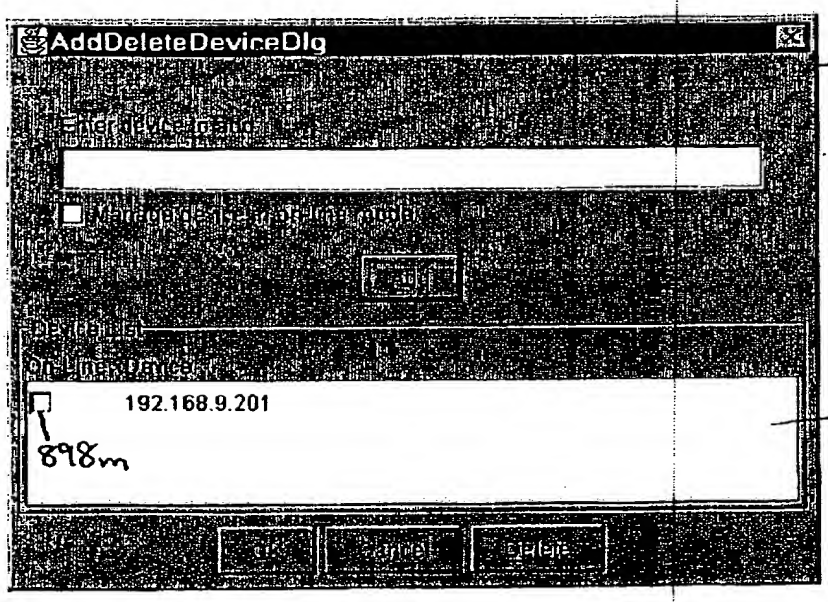

AddDeleteDeviceDlg
192.168.9.201
898e
898d
898g

Fig. 6c


AddDeleteDeviceDlg
898d
192.168.9.201
898m
898g

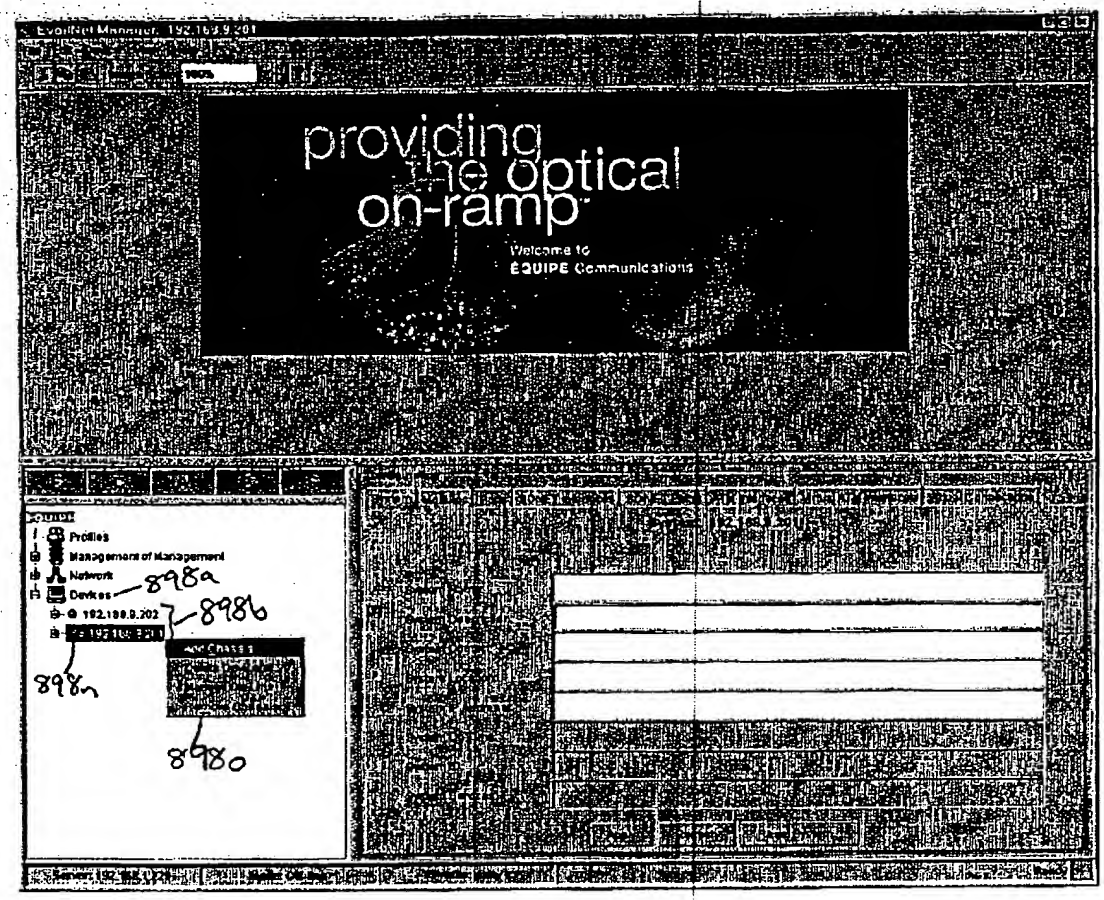

895
providing the optical on-ramp
Welcome to
EQUIPE Communications
Profiles
Management of Management
Network
Devices
898a
898b
898n
898o

Fig. 6d

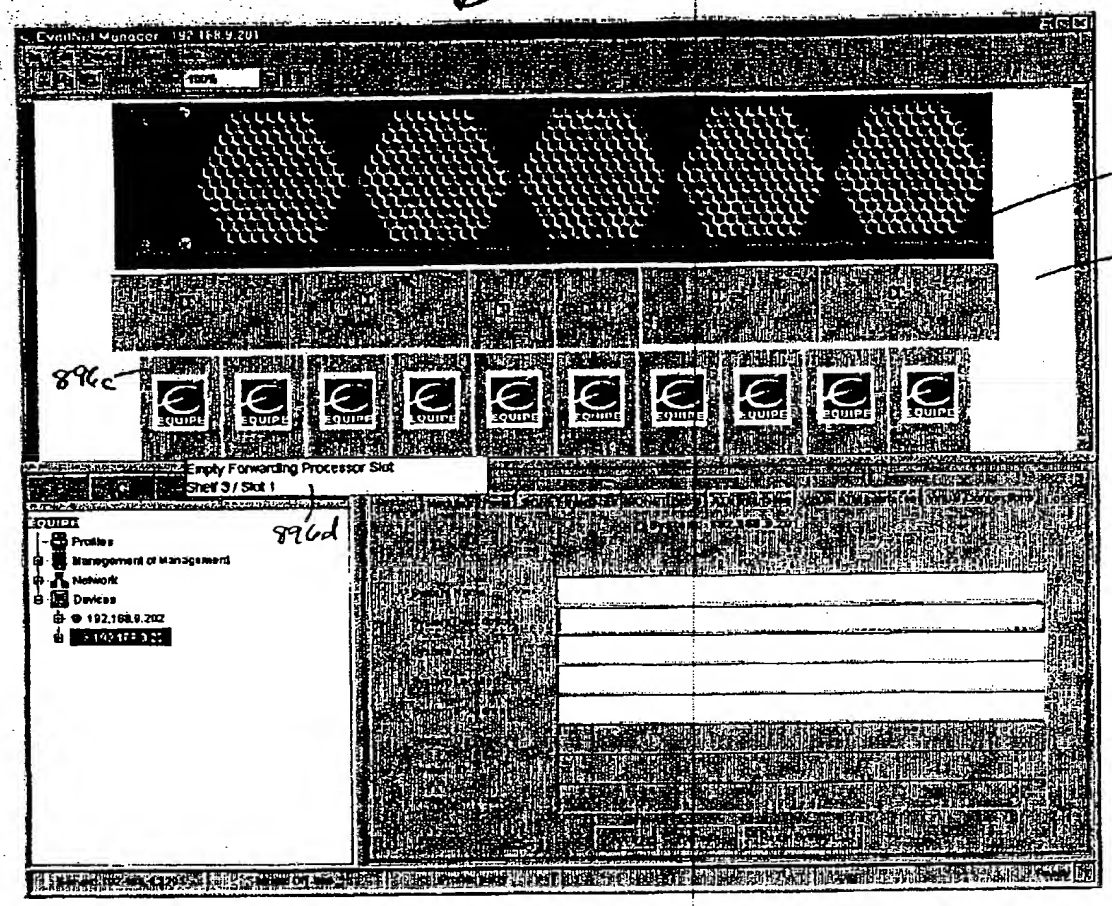

895
896a
896b
896c
896d
Empty Forwarding Processor Slot
Shelf 3 / Slot 1
Profiles
Management of Management
Network
Devices
192.168.9.202

Fig. 6e

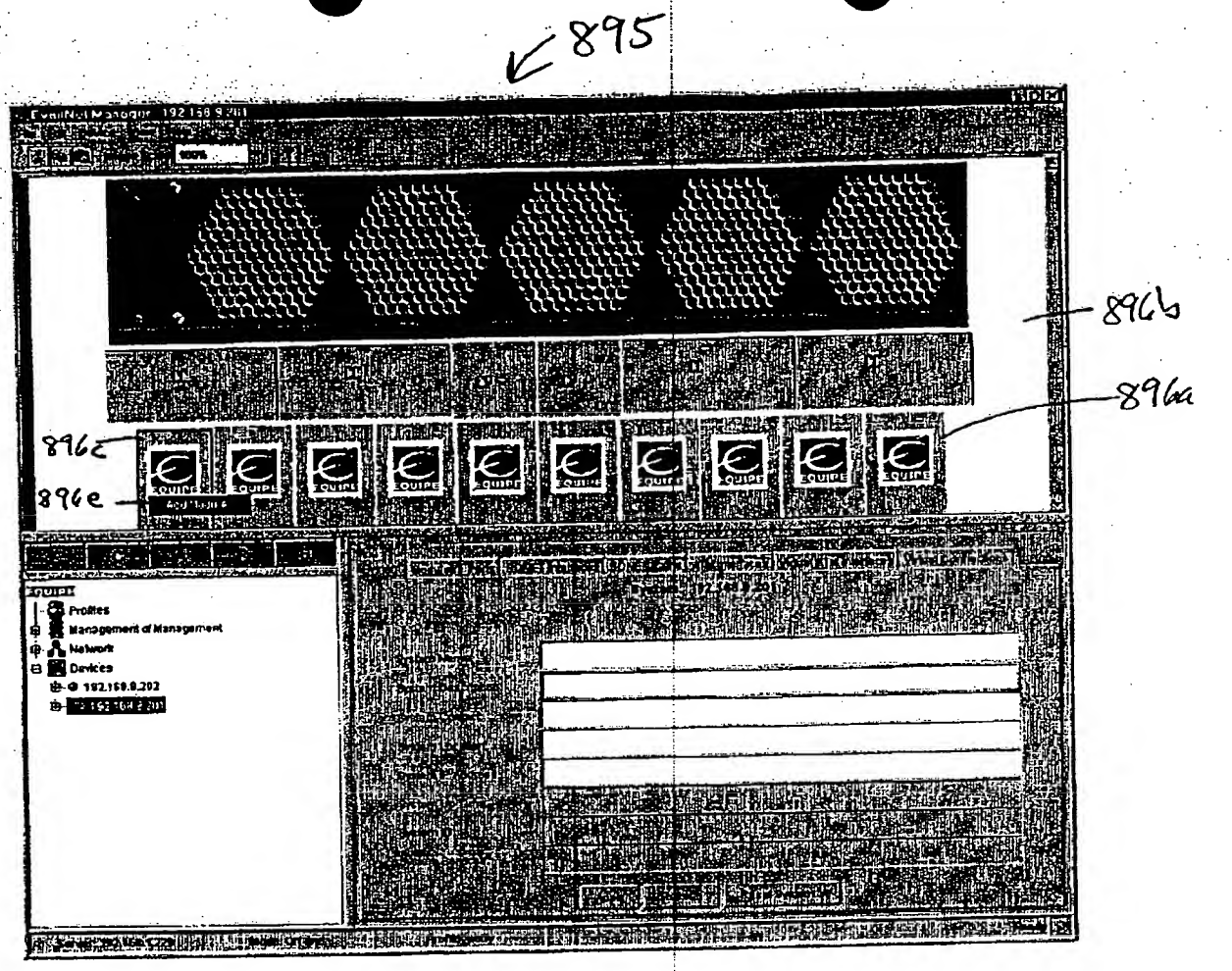

895
896b
896a
896c
896e
EQUIPE
Profiles
Management of Management
Network
Devices

Fig. 6f

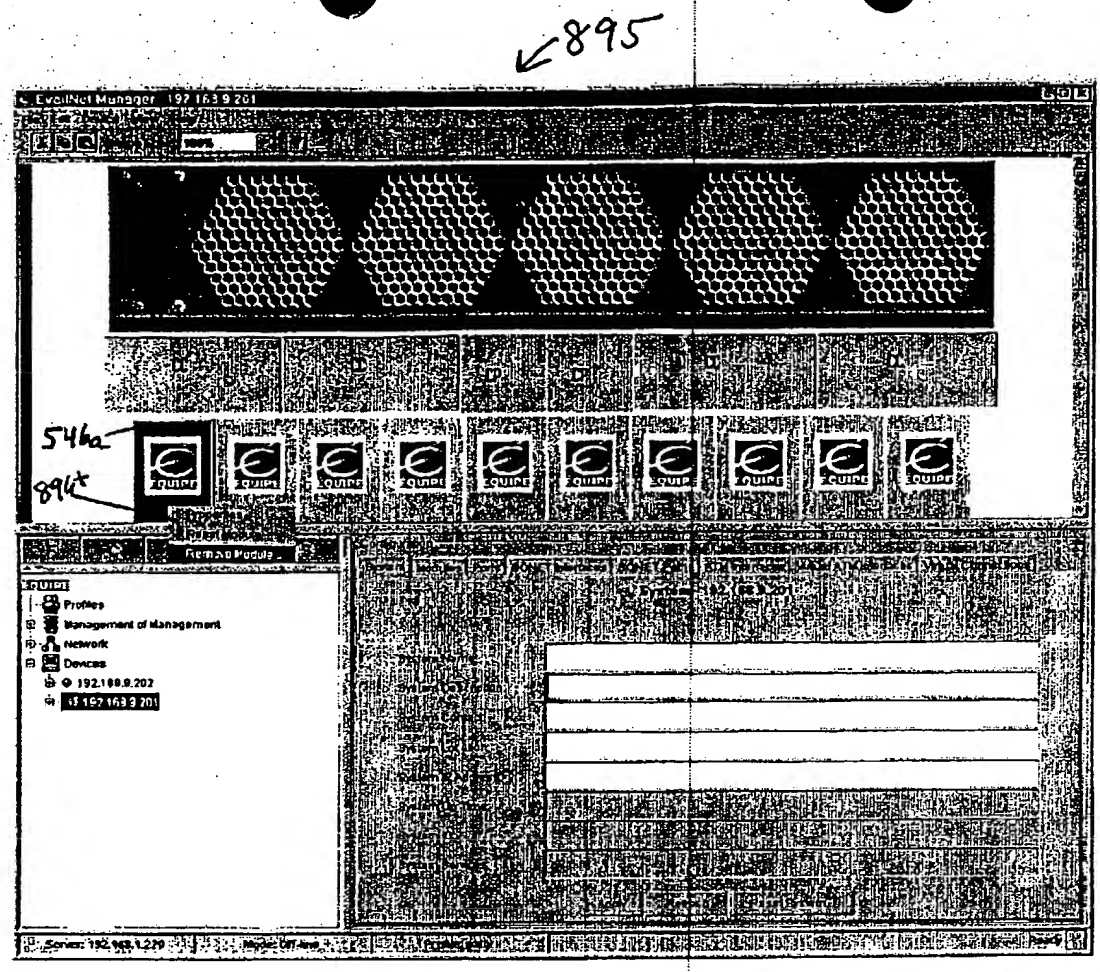

895
546a
894
EquiNet Manager
Remote Module
Profiles
Management of Management
Network
Devices
192.168.9.202
192.168.9.201

Fig. 6g

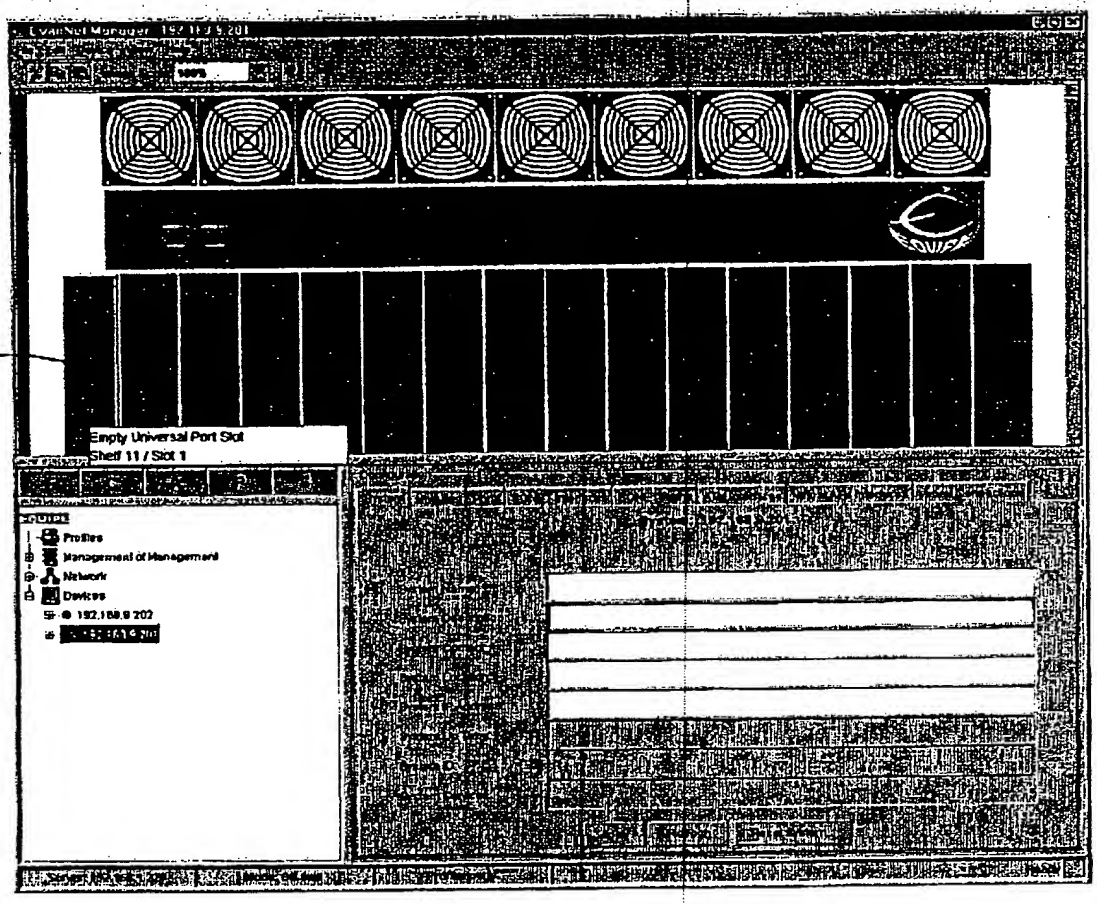

895
896f
Empty Universal Port Slot
Shelf 11 / Slot 1
Profiles
Management of Management
Network
Devices

Fig. 6h

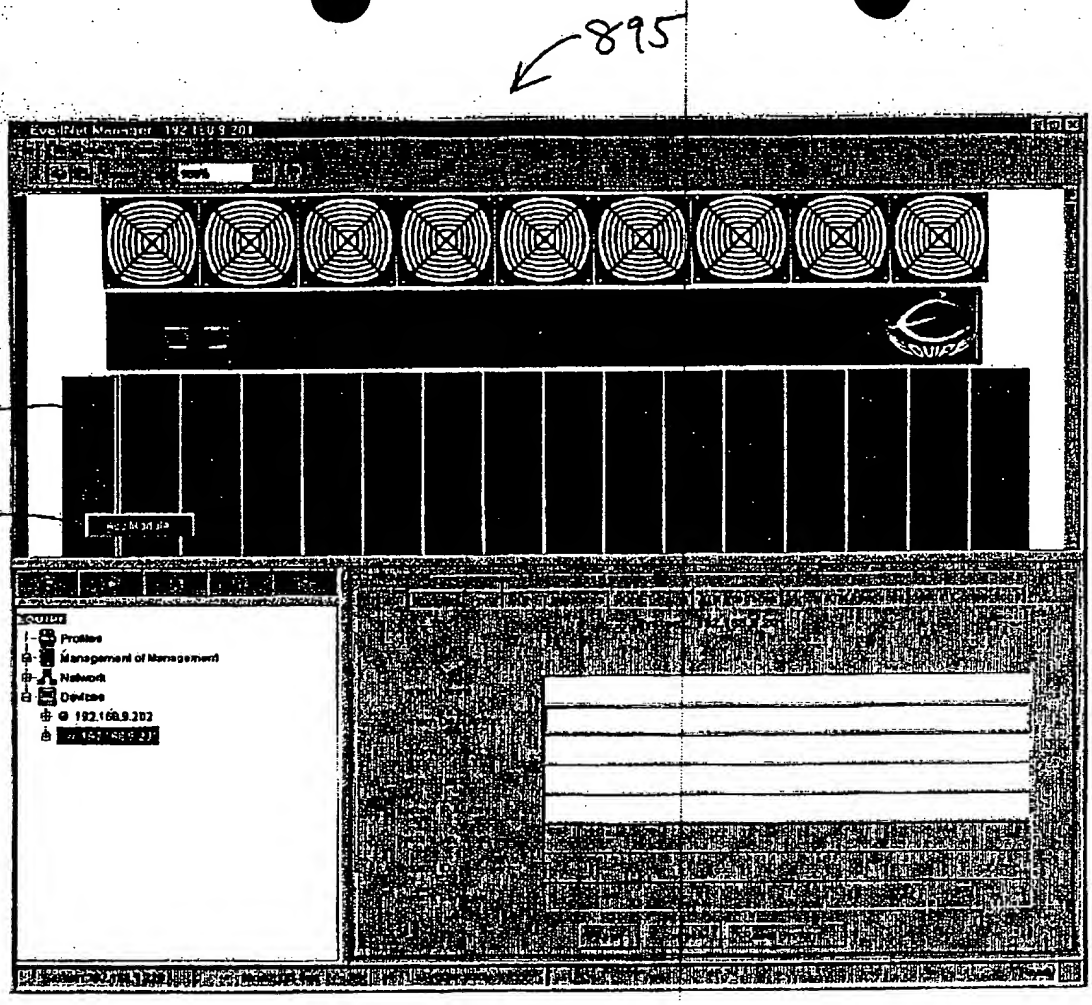
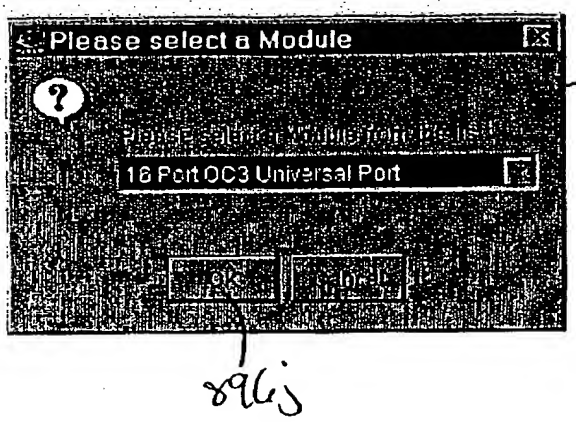

895
896f
896g
Profiles
Management of Management
Network
Devices

Fig. 6i

Fig. 6J


Please select a Module
16 Port OC3 Universal Port
OK
896h
896j

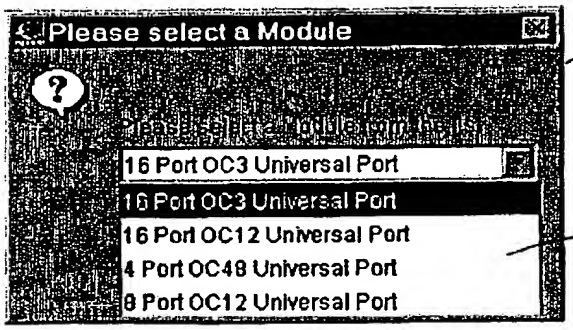

Please select a Module
16 Port OC3 Universal Port
16 Port OC3 Universal Port
16 Port OC12 Universal Port
4 Port OC48 Universal Port
8 Port OC12 Universal Port
896h
896i

Fig. 6K

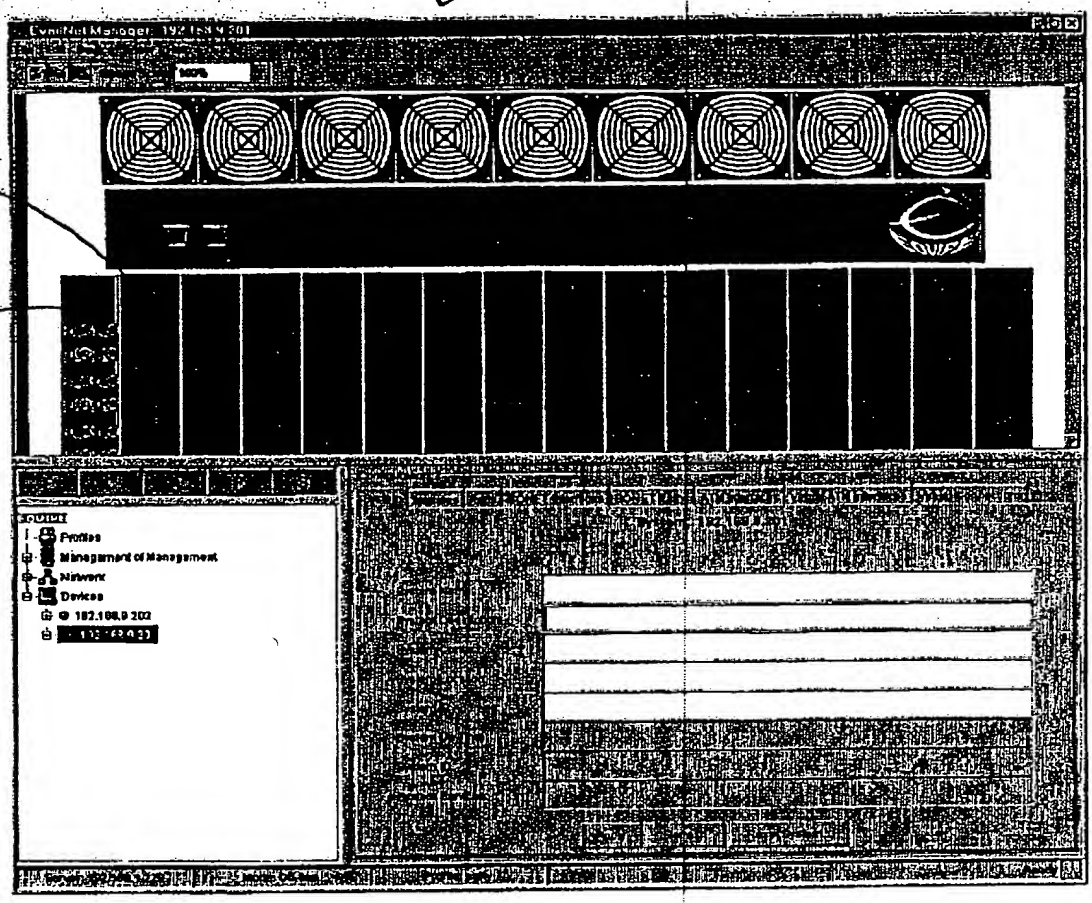

895
5561
556h
Profiles
Management of Management
Network
Devices

Fig. 6L

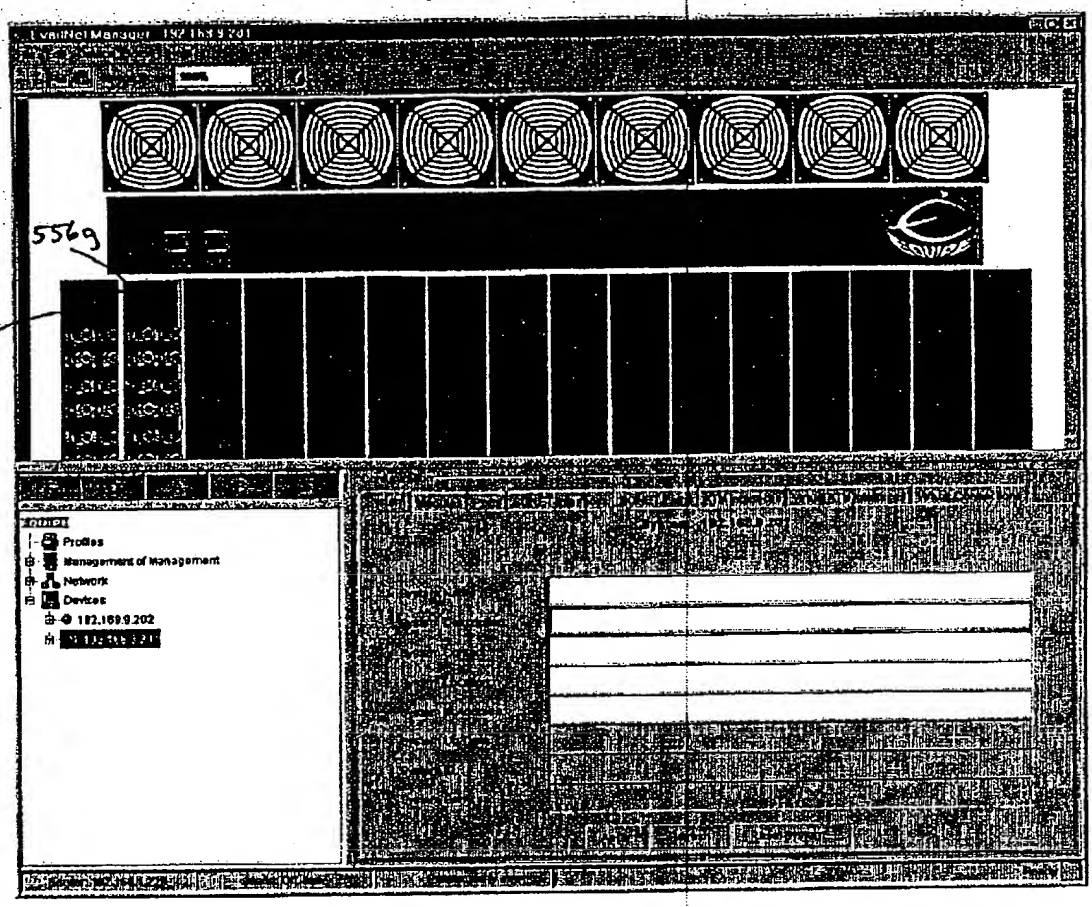

895
556g
556h
Profiles
Management of Management
Network
Devices
192.168.9.202

Fig 6m

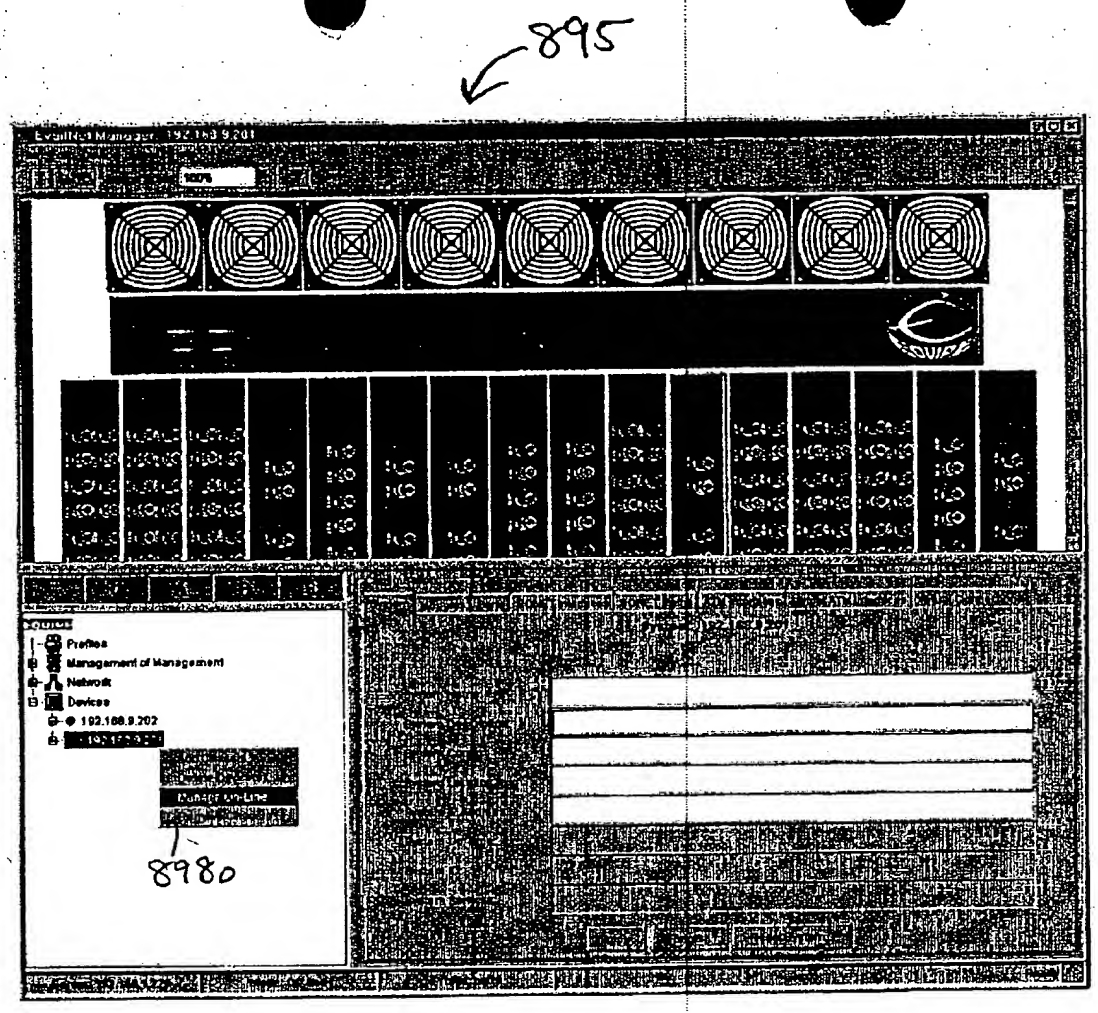
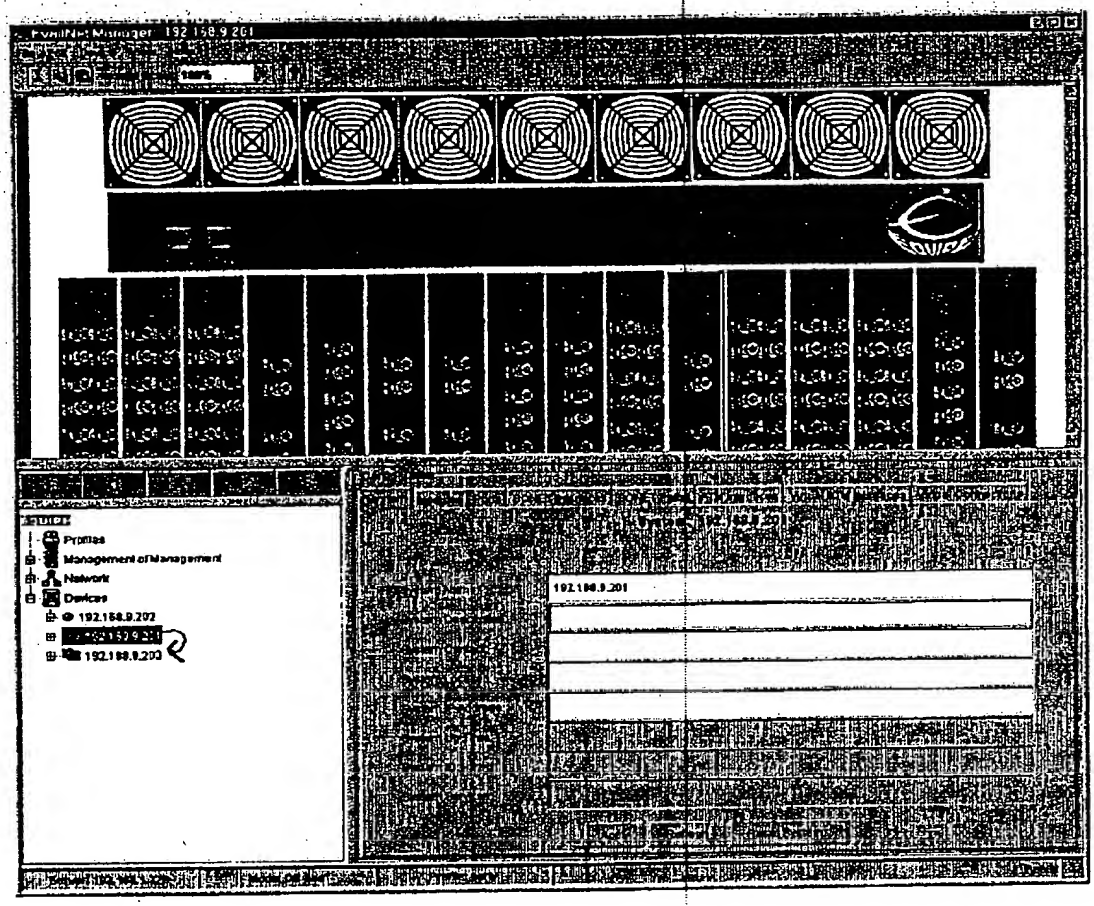

895
Profiles
Management of Management
Network
Devices
192.168.9.202
8980

Fig. 6n

895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Management of Management
Network
Devices
192.168.9.202
192.168.9.200
192.168.9.201

Fig. 6o

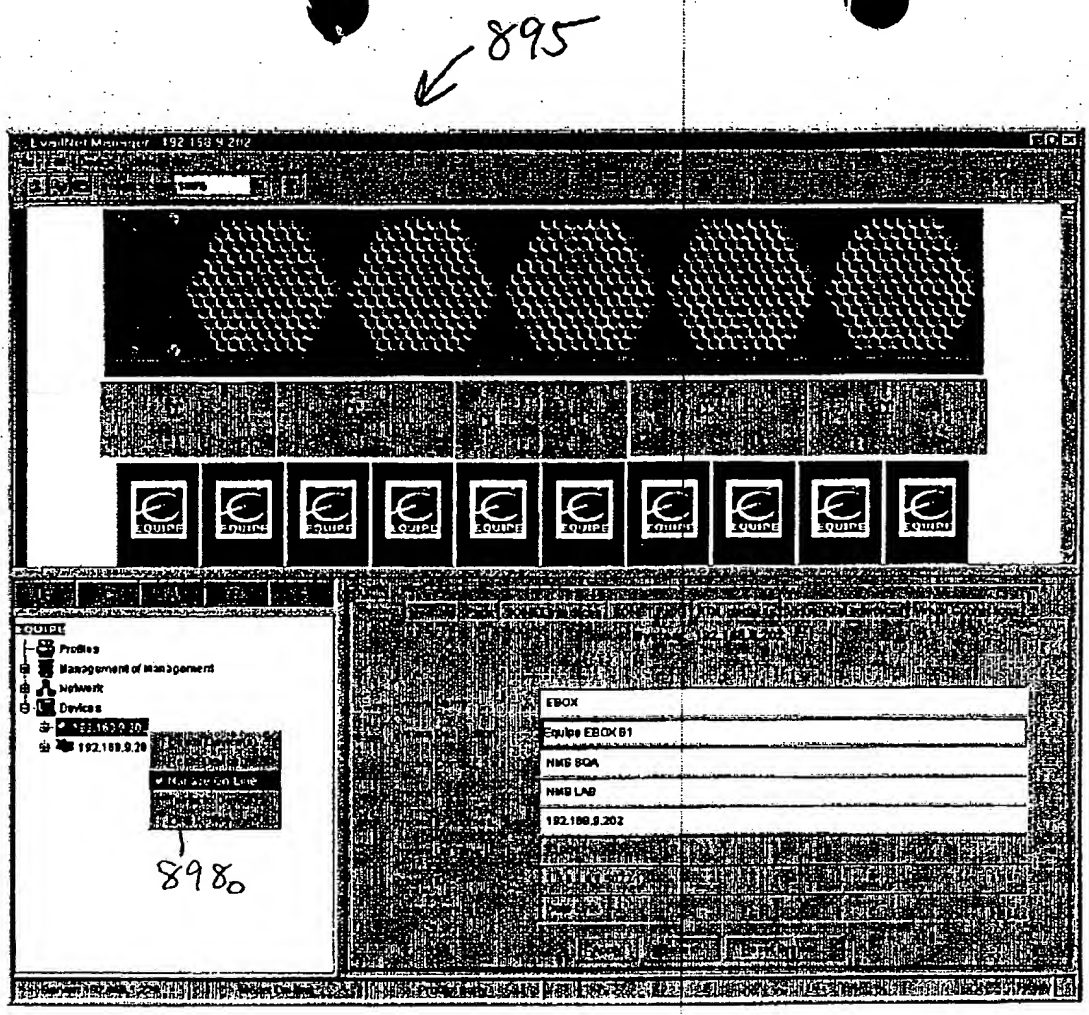

895
EQUIPE
Profiles
Devices
EBOX
Equipe EBOX B1
NMS SQA
NMS LAB
192.168.9.202
8980

Fig. 6p

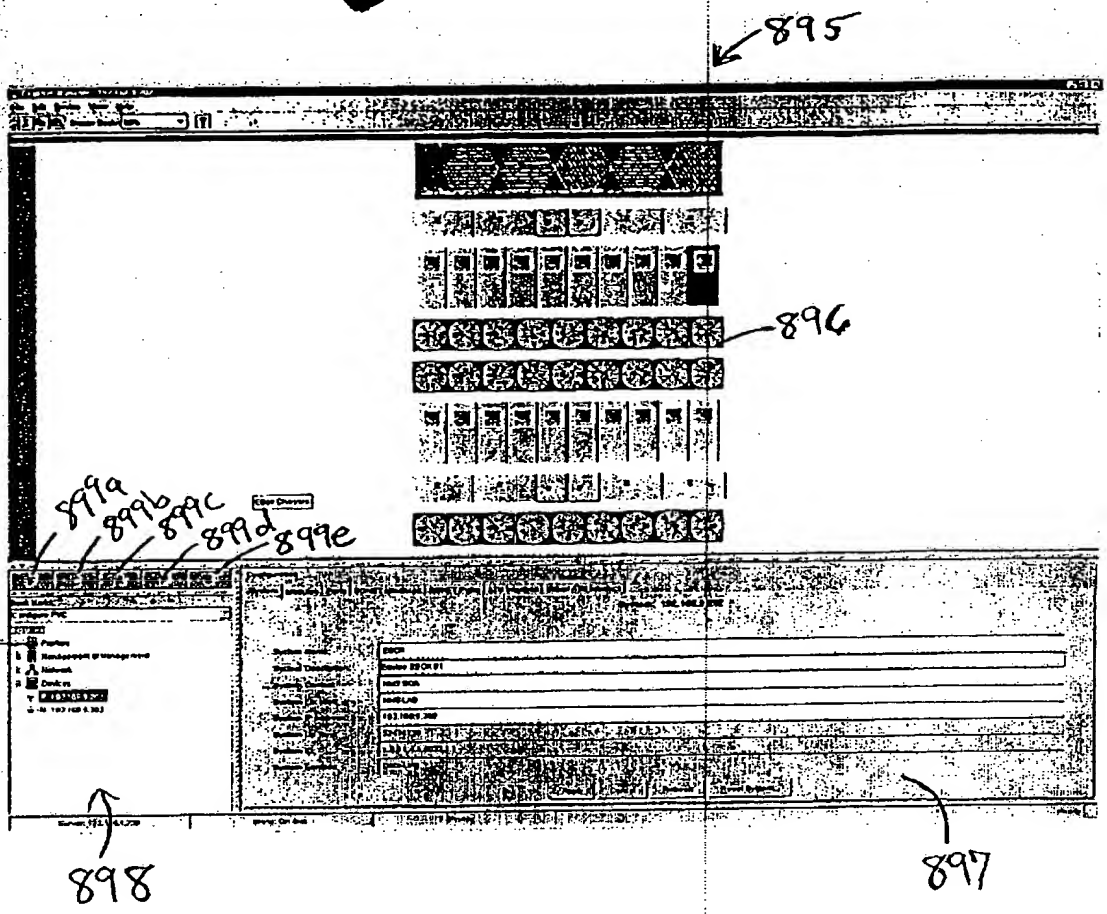
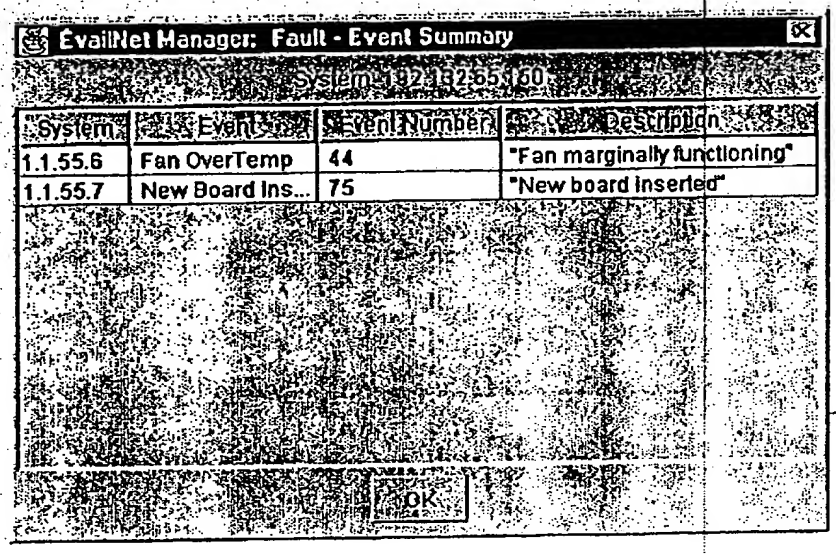


Fig. 7a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System 192.182.55.150
System
Event
Event Number
Description
1.1.55.6
Fan OverTemp
44
"Fan marginally functioning"
1.1.55.7
New Board Ins...
75
"New board inserted"
OK

Fig. 7b

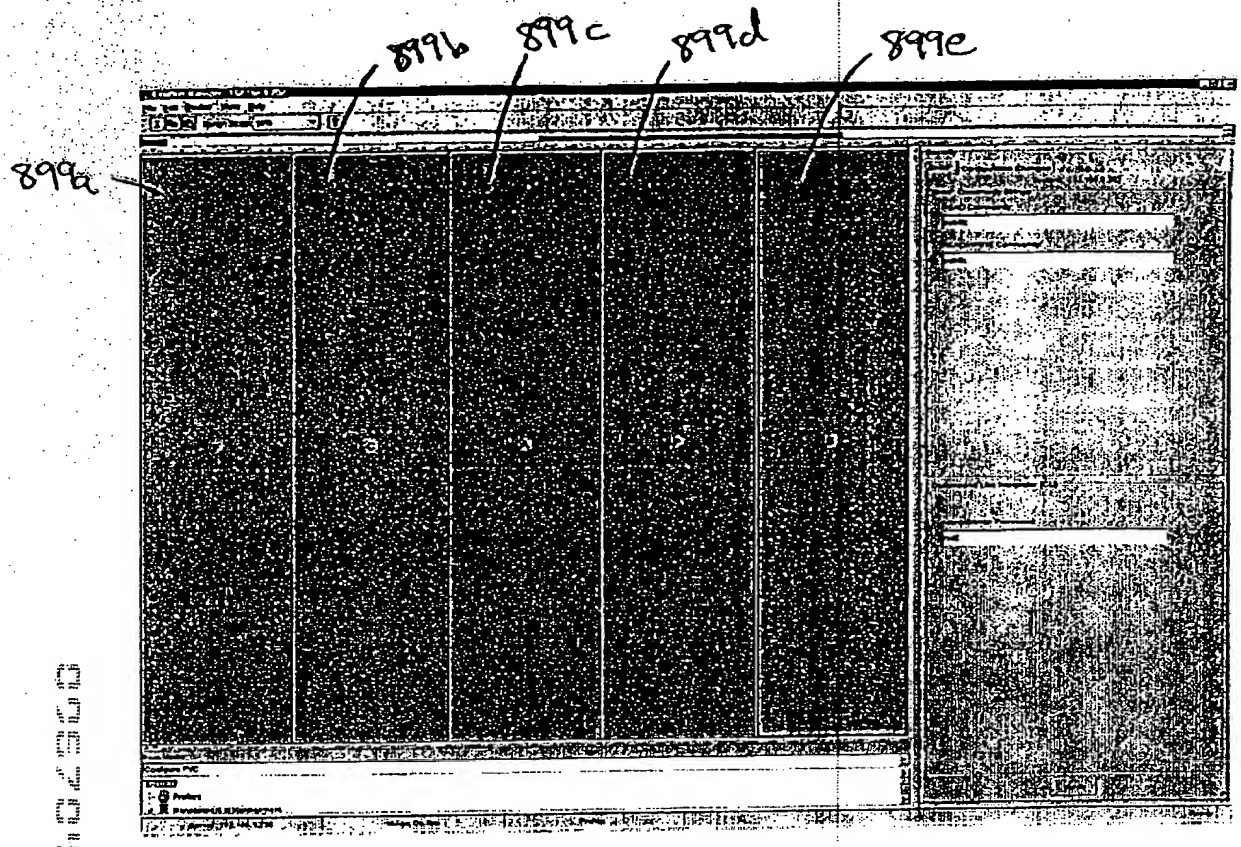


Fig. 7c

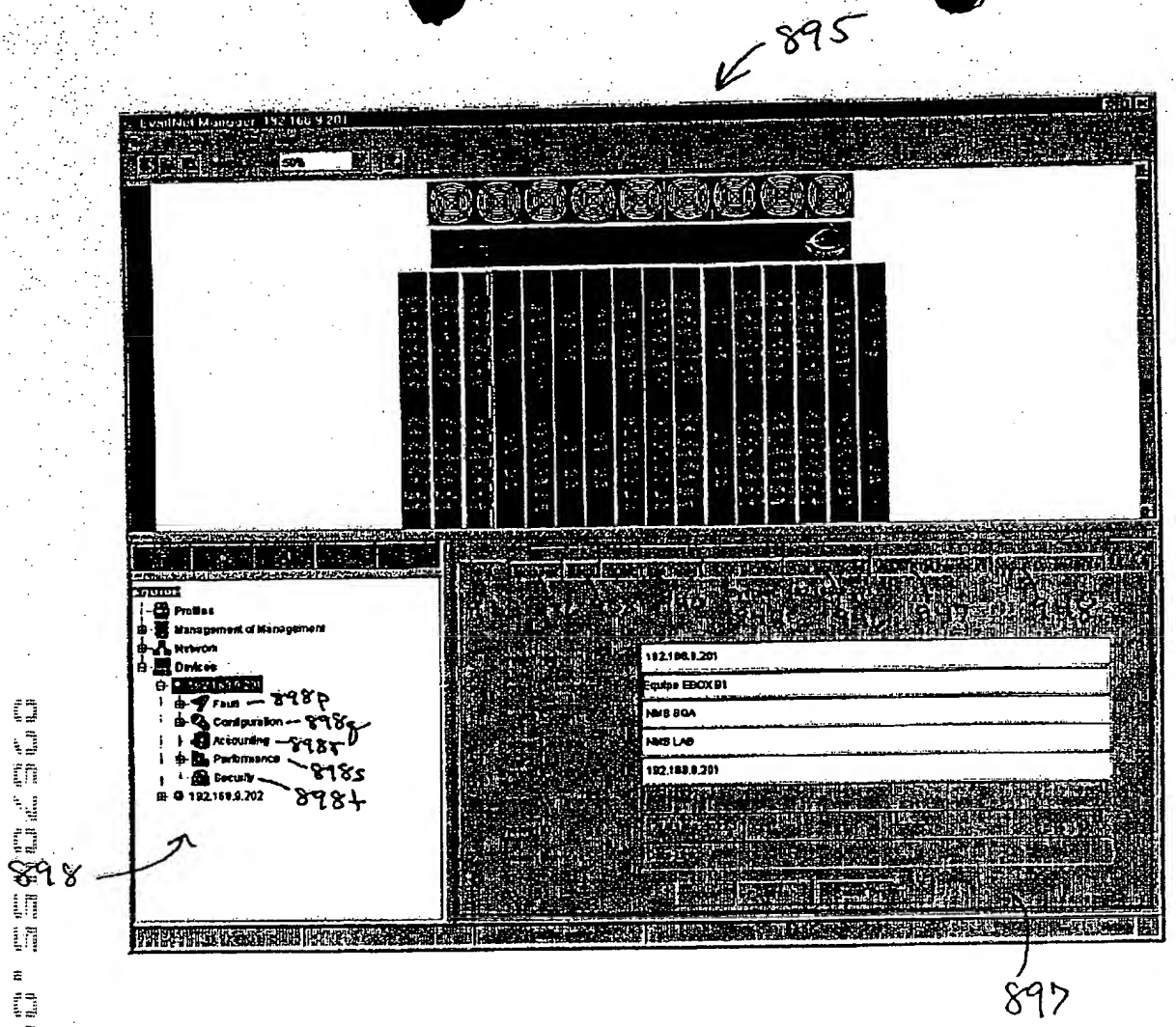

895
Profiles
Management of Management
Network
Devices
Fault
Configuration
Accounting
Performance
Security
192.168.9.202
898p
898f
898t
898s
898t
898
192.168.9.201
Equipe EBOX 01
NMS SQA
NMS LAB
192.168.9.201
897

Fig. 7d

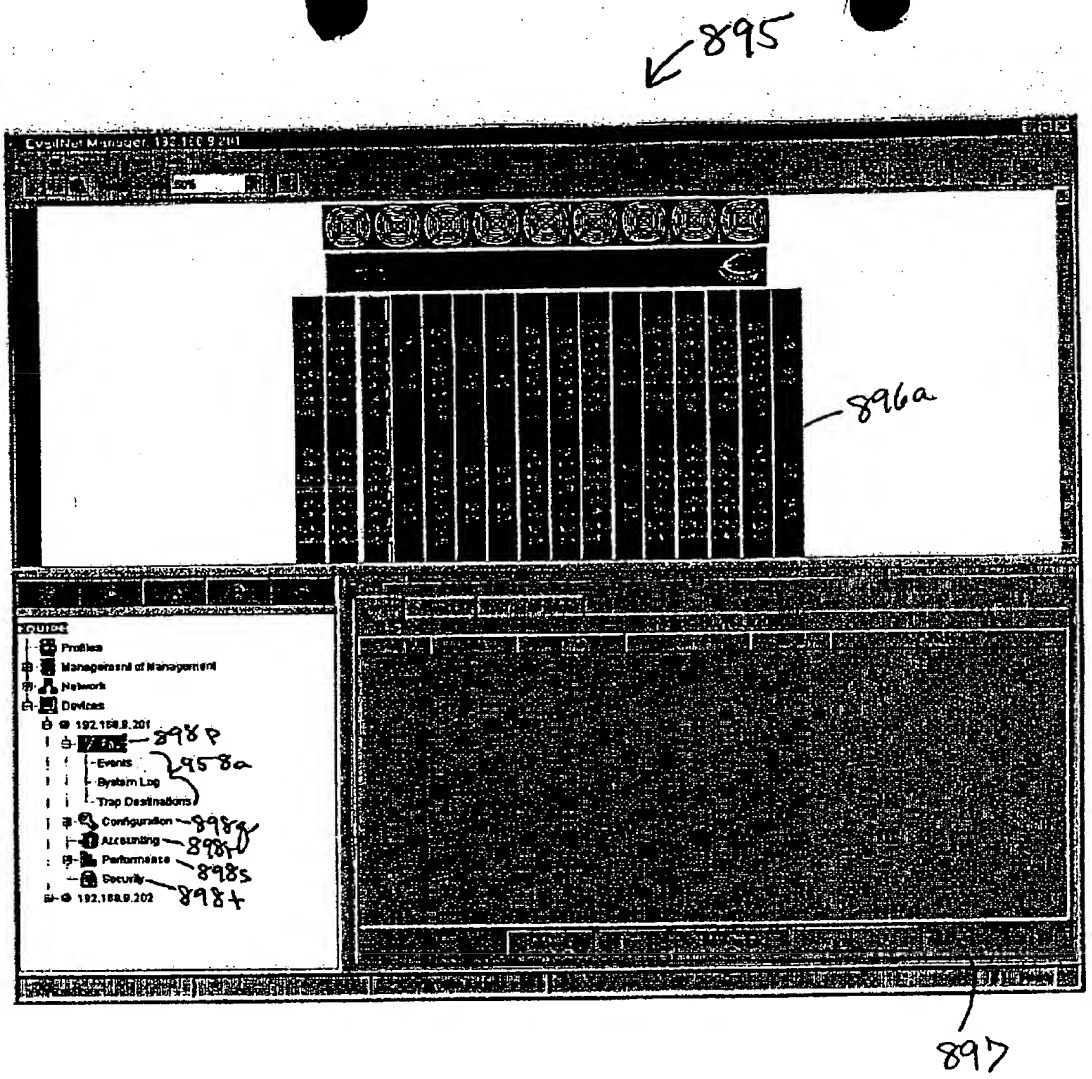


Fig. 7e

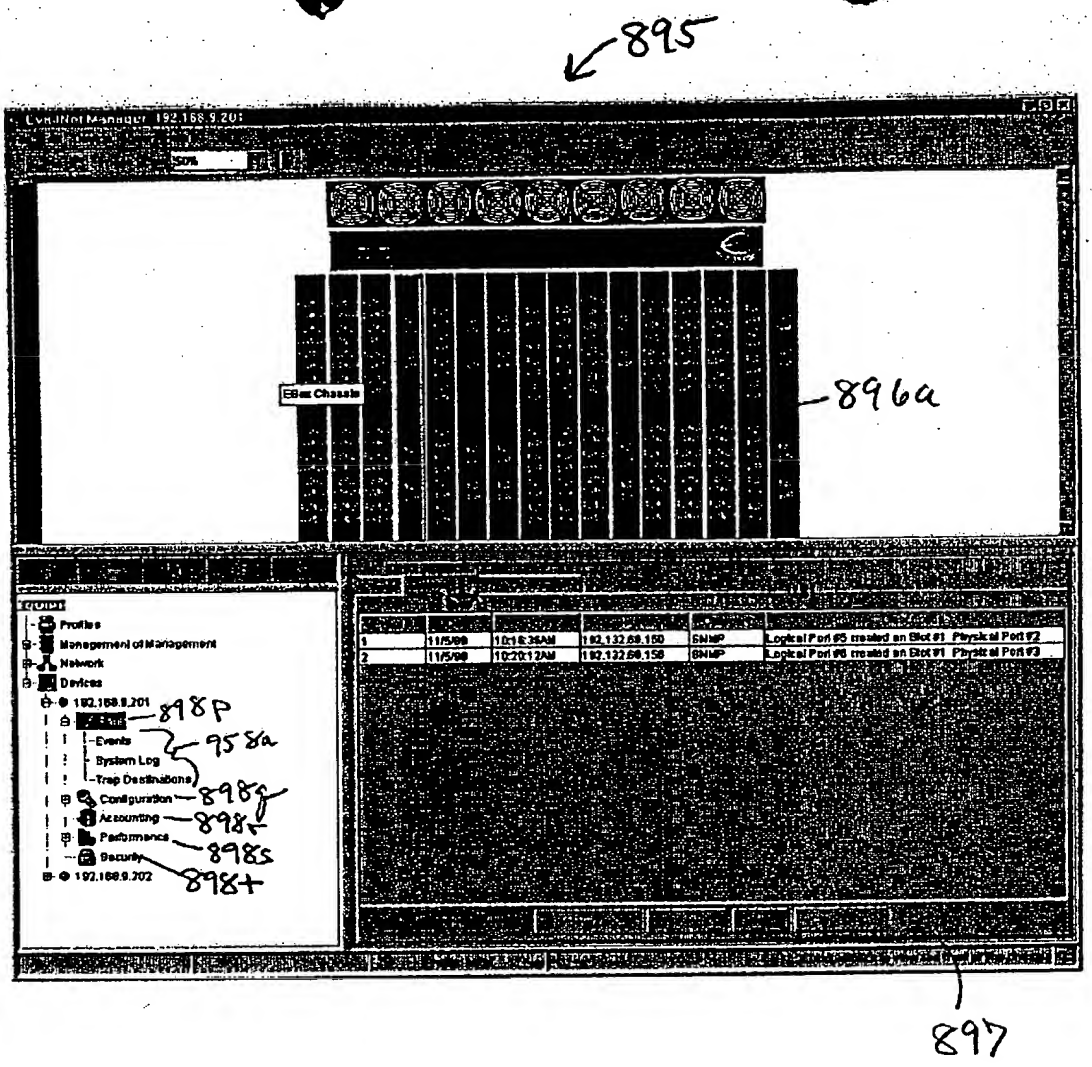
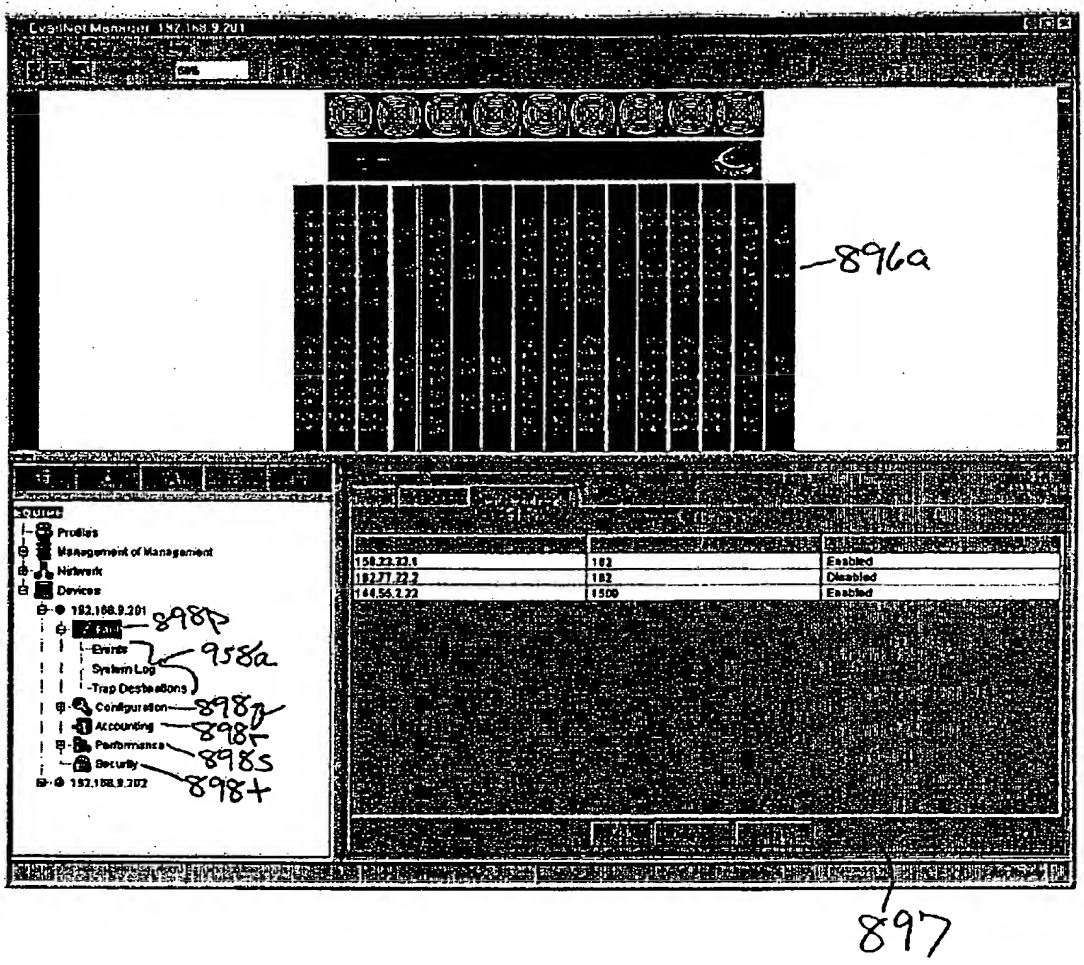

895
896a
898p
958a
898g
898r
898s
898t
897
Profiles
Management of Management
Network
Devices
Events
System Log
Trap Destinations
Configuration
Accounting
Performance
Security

Fig. 7f


895
896a
Profiles
Management of Management
Network
Devices
898p
Events
System Log
Trap Destinations
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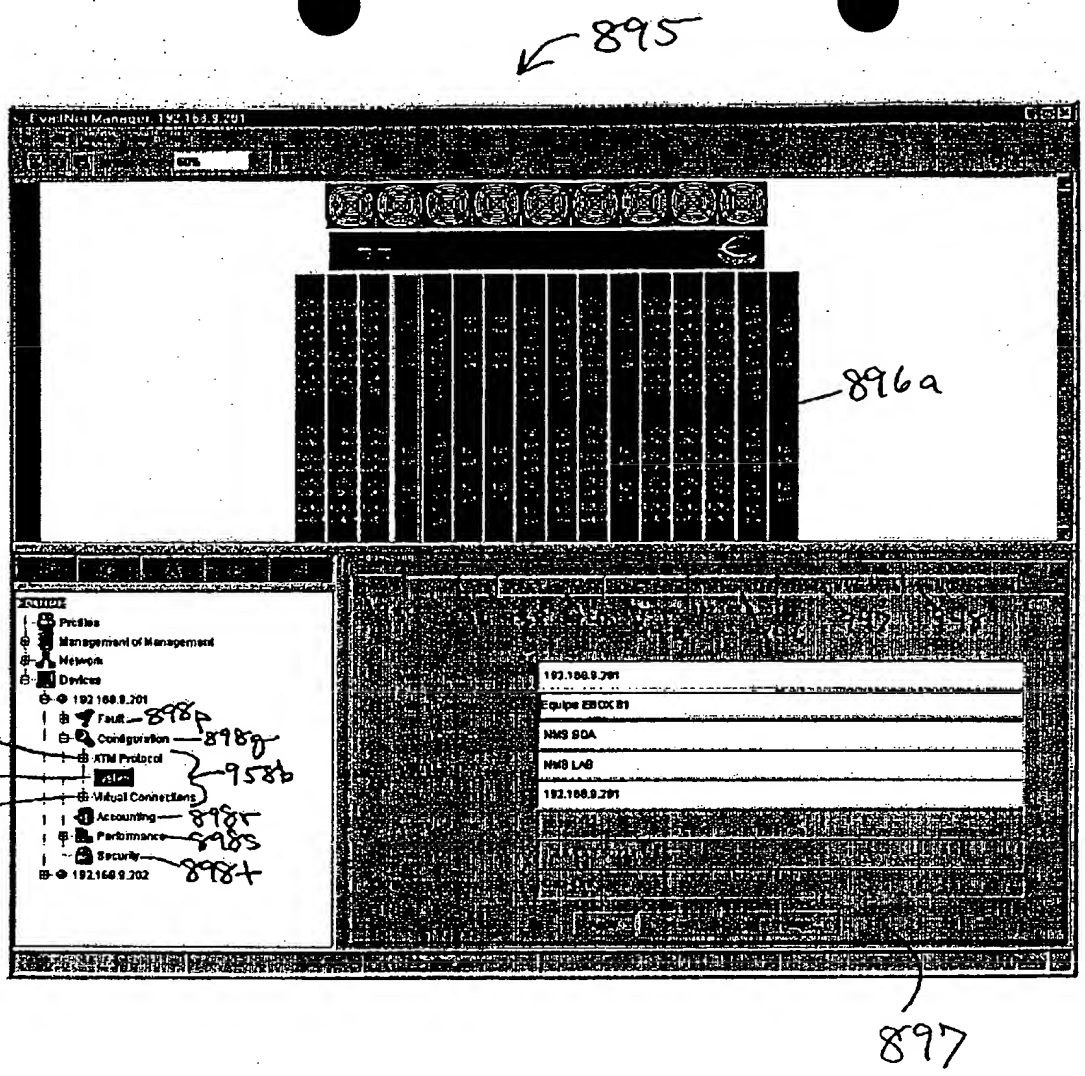
898q
Configuration
898r
Accounting
898s
Performance
Security
898t
Enabled
Disabled
Enabled
897

Fig. 7g


895
896a
897
Profiles
Management of Management
Network
Devices
192.168.9.201
Fault
Configuration
ATM Protocol
Virtual Connections
Accounting
Performance
Security
192.168.9.202
958c
958d
958e
898p
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898s
898t
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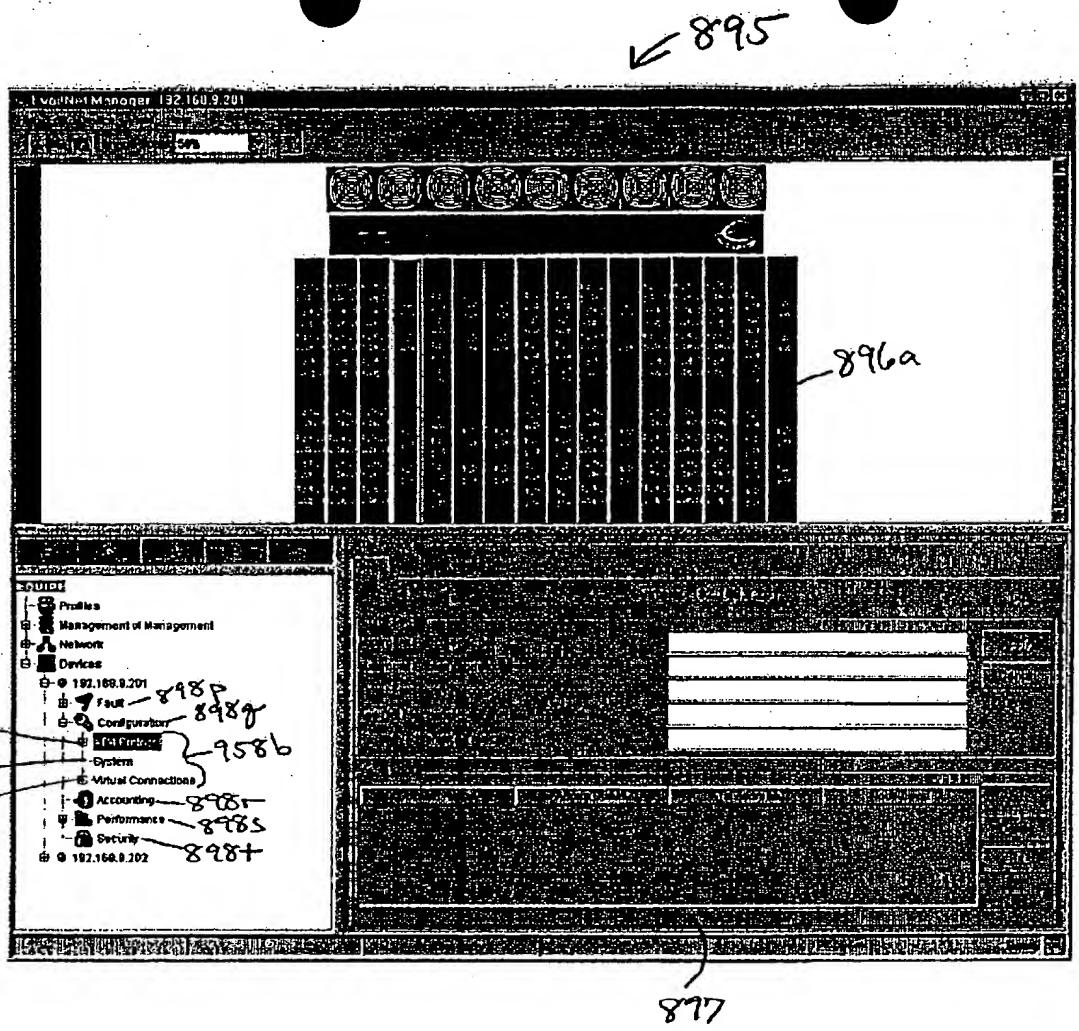
Equipe EBOX 81
NMS SOA
NMS LAB
192.168.9.201

Fig. 7h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896a
Profiles
Management of Management
Network
Devices
192.168.9.201
Fault
Configuration
System
Virtual Connections
Accounting
Performance
Security
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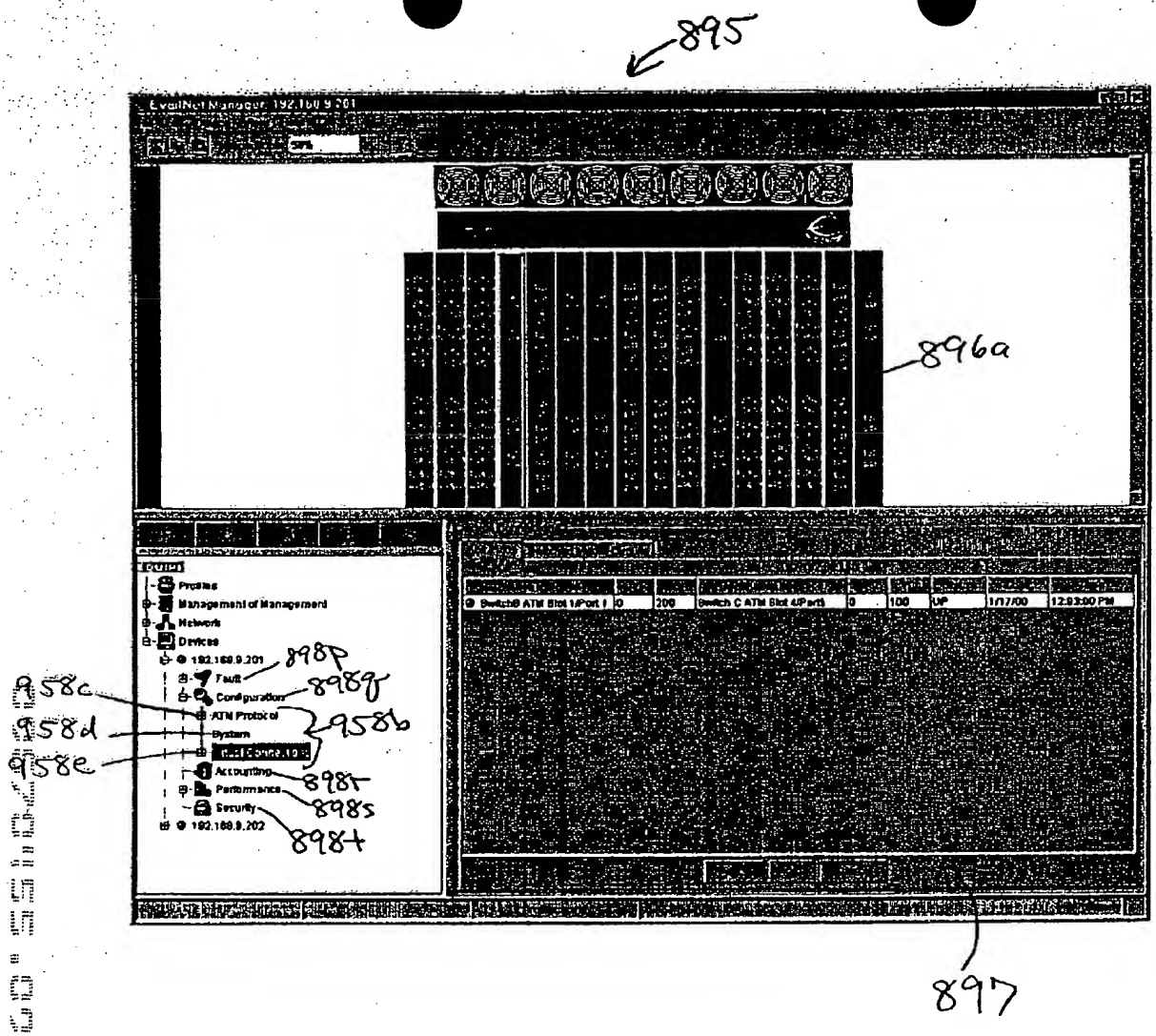
898s
898t
877

Fig 7i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896a
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898p
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958d
958e
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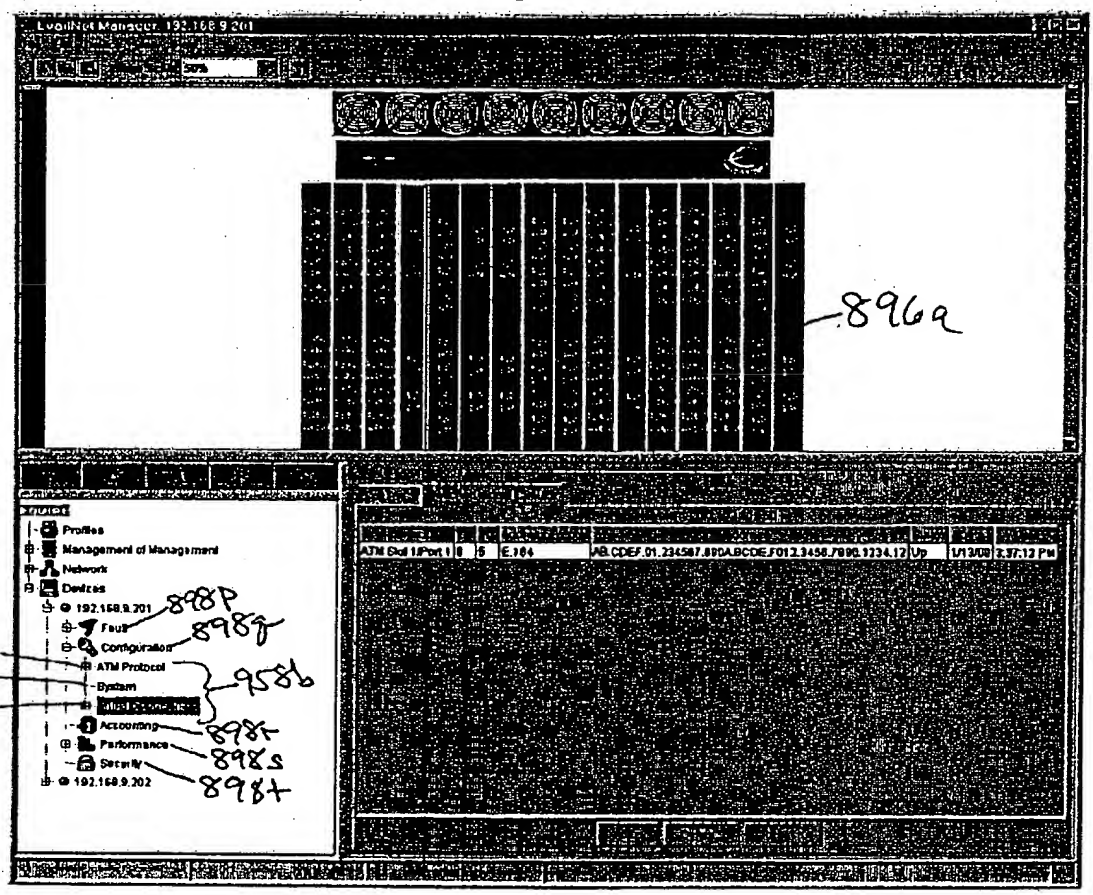
Profiles
Management of Management
Network
Devices
Fault
Configuration
ATM Protocol
System
Accounting
Performance
Security

Fig. 7j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896a
Profiles
Management of Management
Network
Devices
192.168.9.201
Fault
Configuration
ATM Protocol
System
Accounting
Performance
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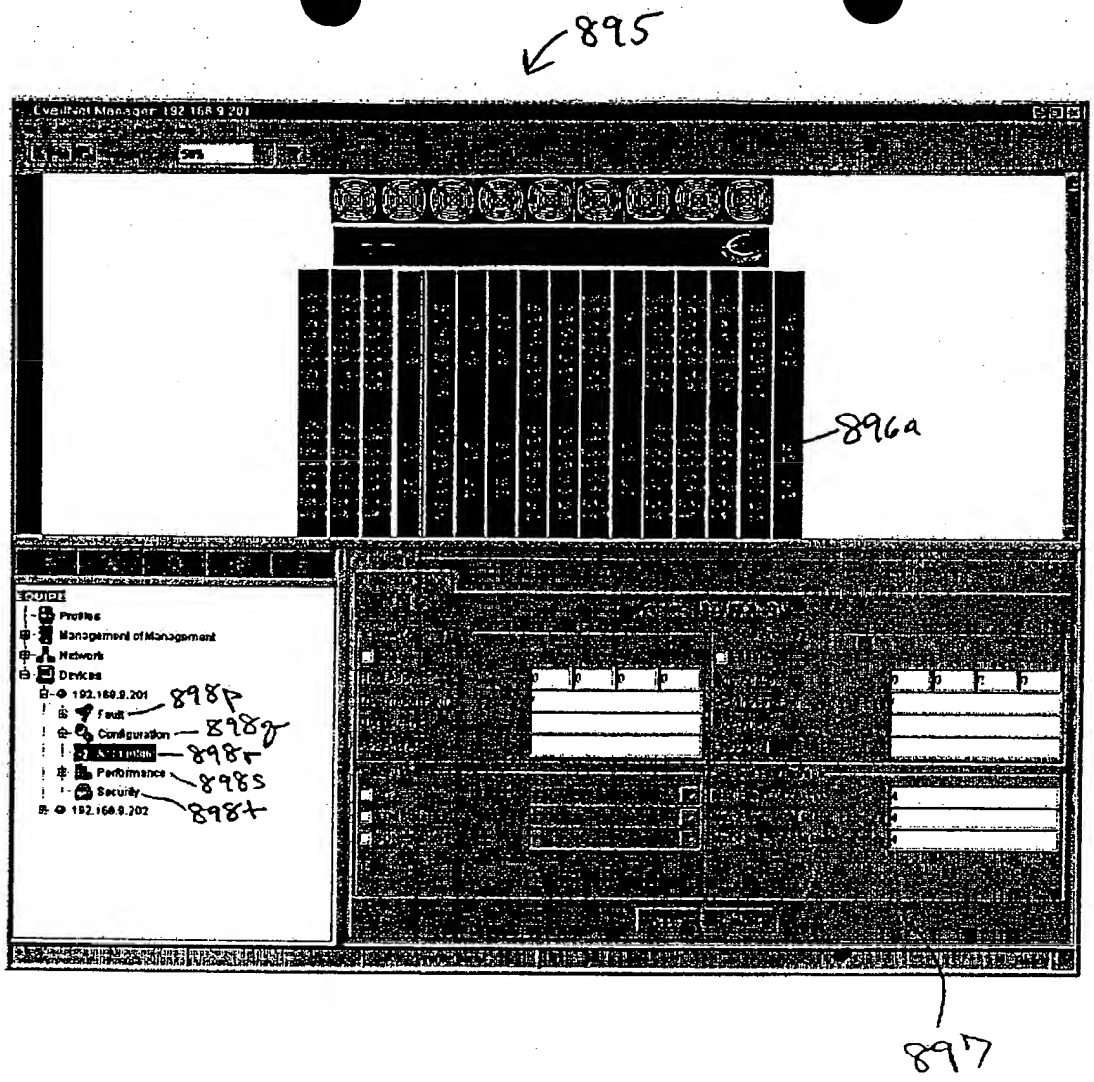
Fig. 7K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898p
898q
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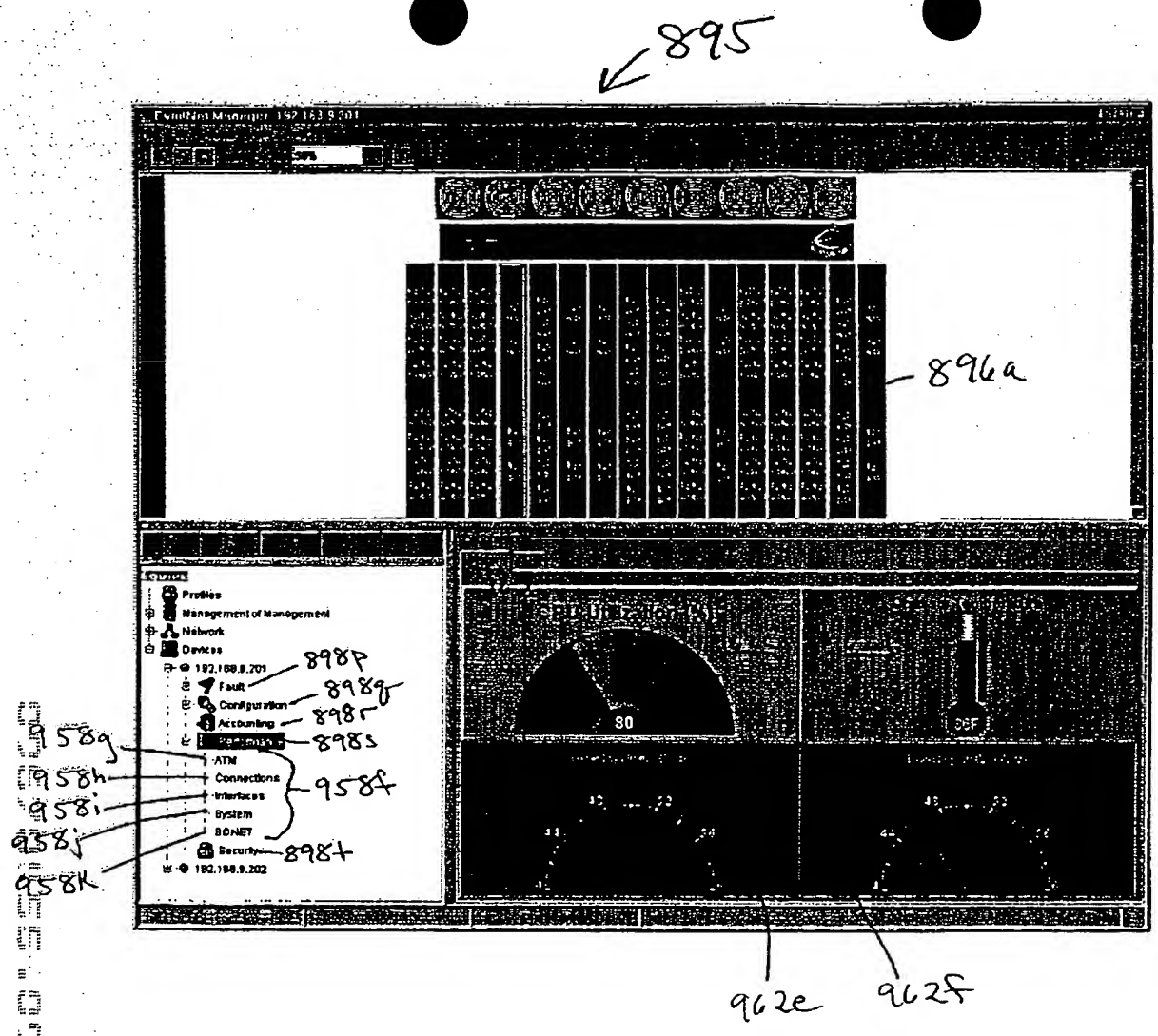
Profiles
Management of Management
Networks
Devices
192.168.9.201
Fault
Configuration
Performance
Security
192.168.9.202

Fig. 7L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Management of Management
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Fault
Configuration
Accounting
Performance
ATM
Connections
Interfaces
System
SONET
Security
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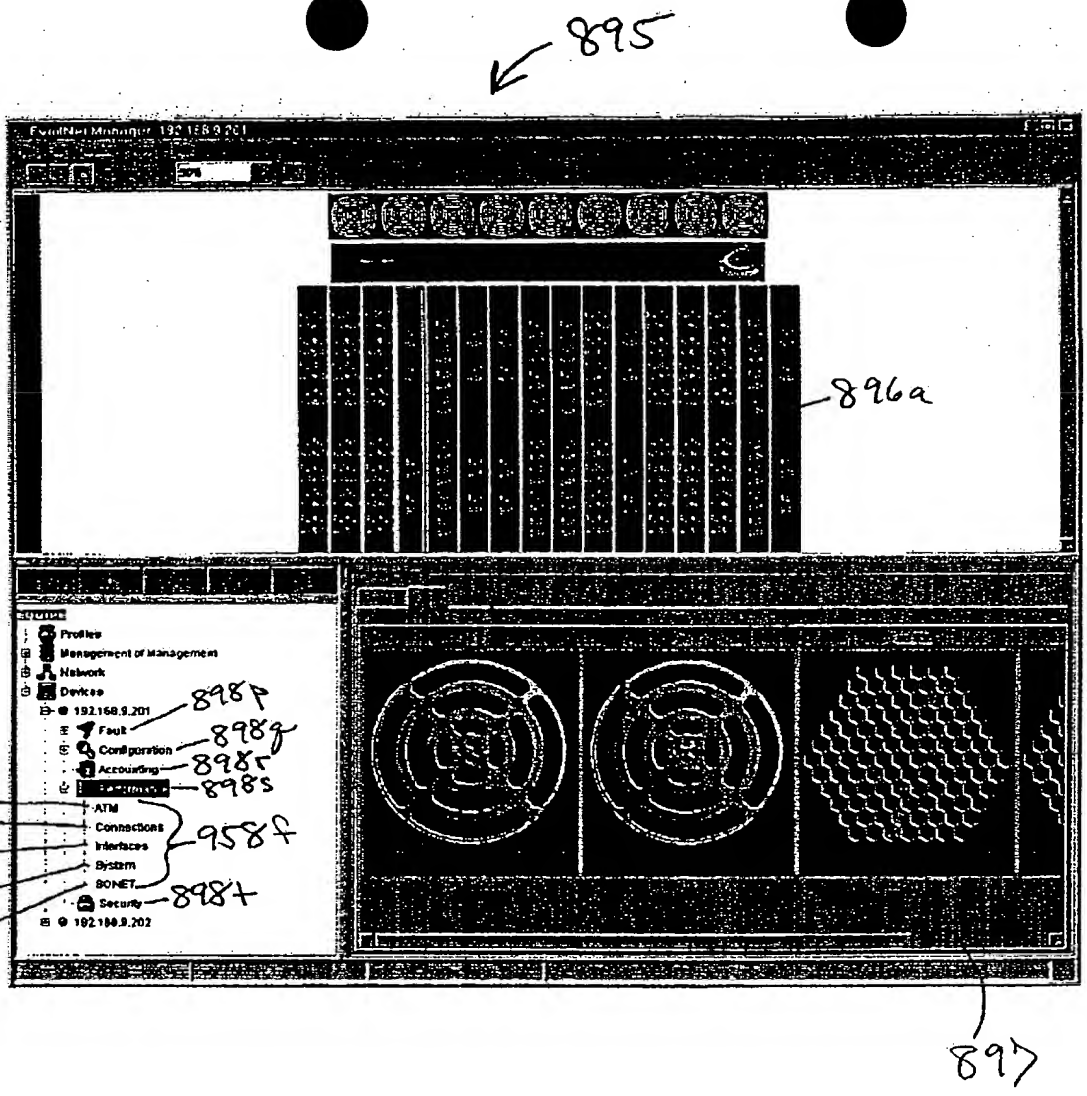
962f

Fig. 7m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Profiles
Management of Management
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Devices
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Configuration
Accounting
Performance
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Connections
Interfaces
System
SONET
Security
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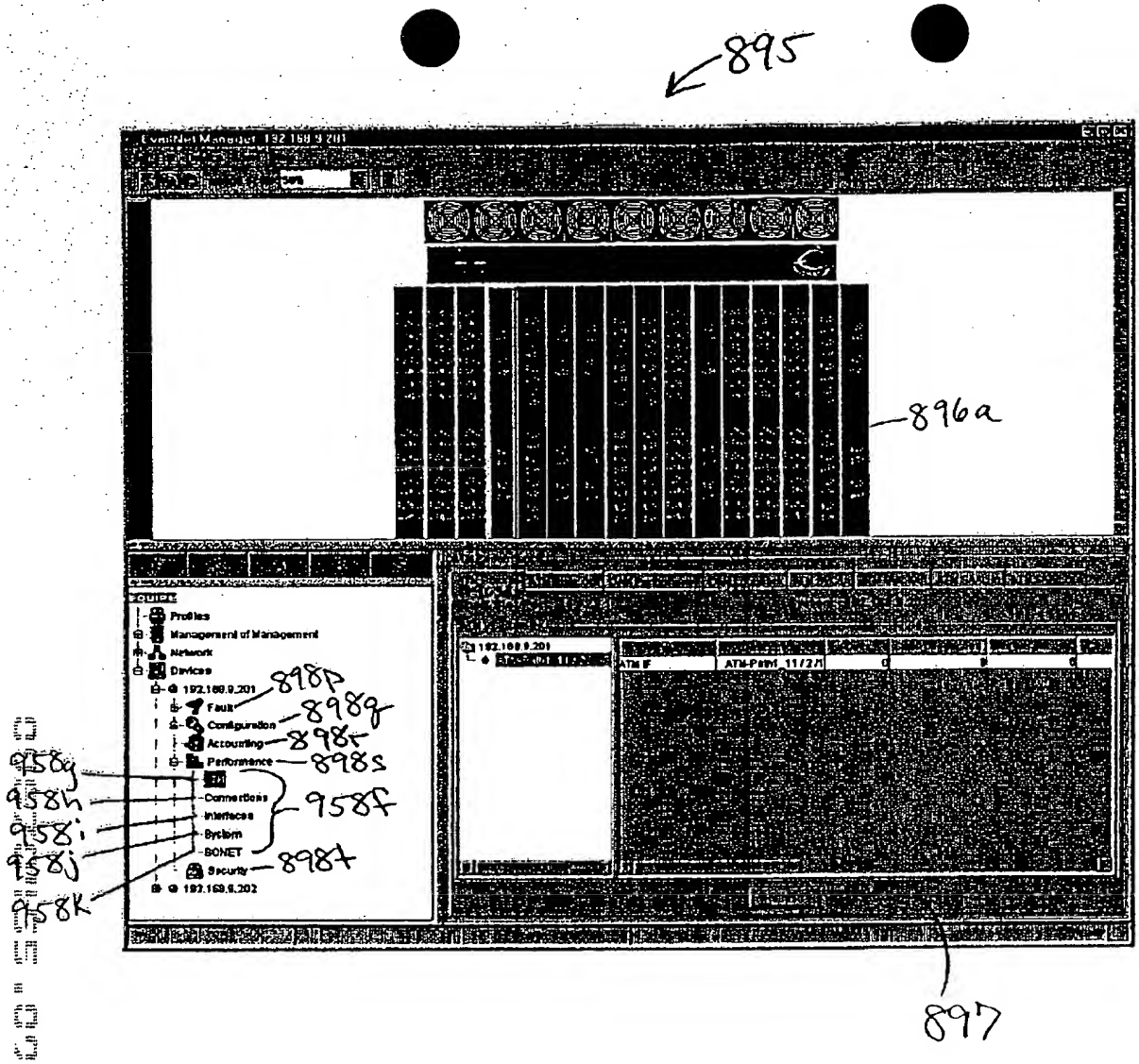
Fig. 7n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Profiles
Management of Management
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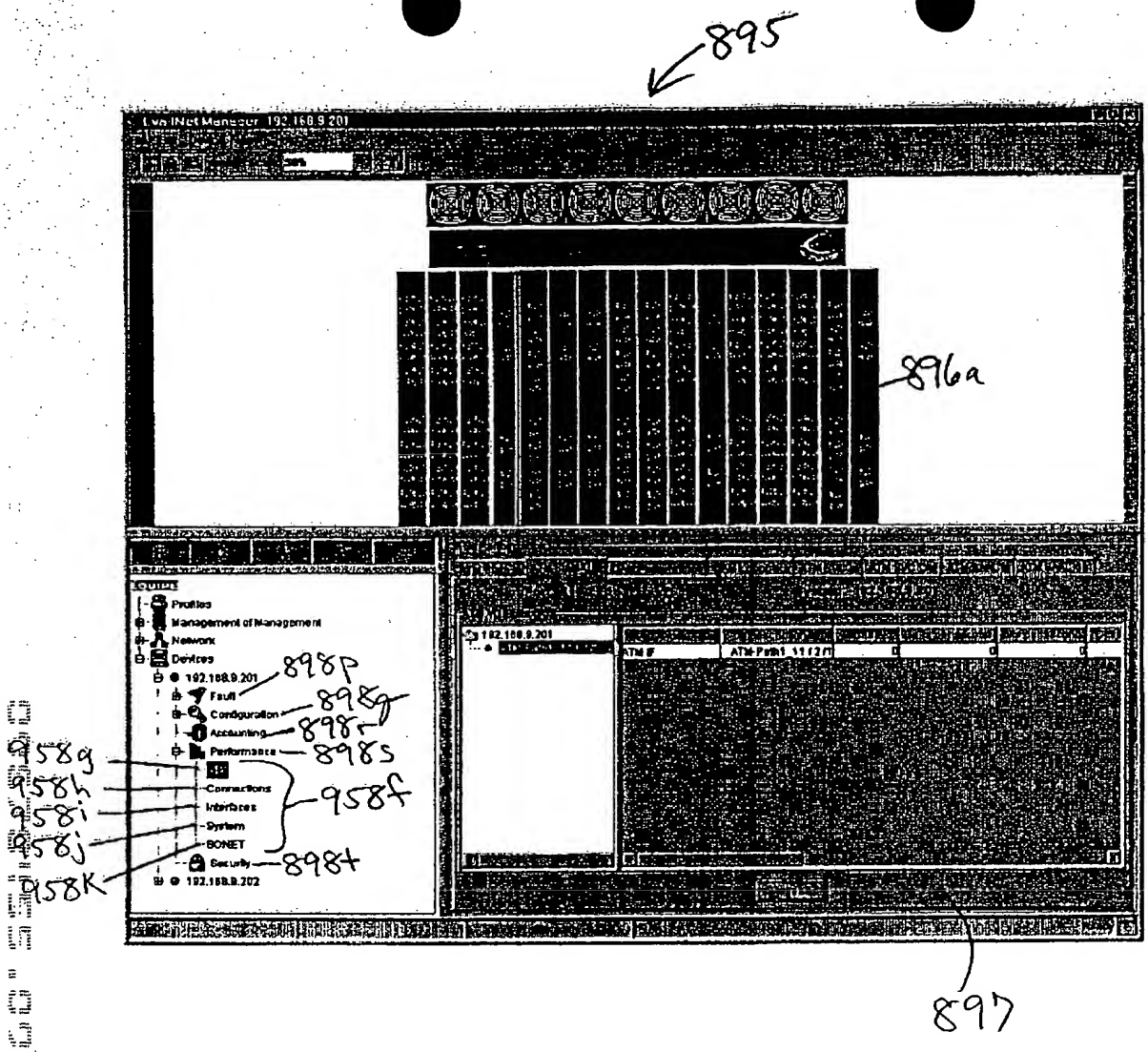
Accounting
Performance
Connections
Interfaces
System
SONET
Security

Fig. 7o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Management of Management
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Devices
Fault
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Accounting
Performance
Connections
Interfaces
System
SONET
Security

Fig. 7P

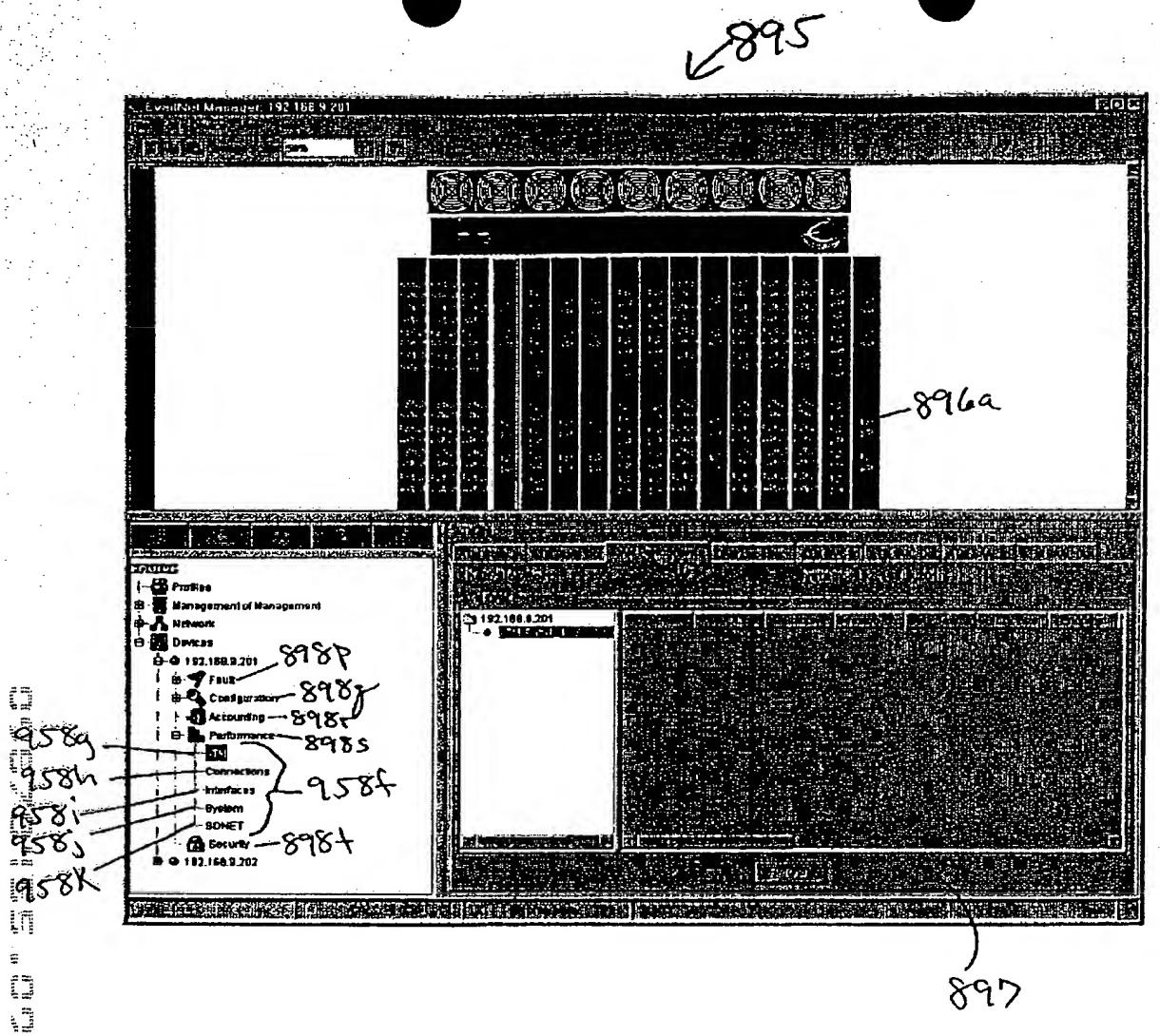
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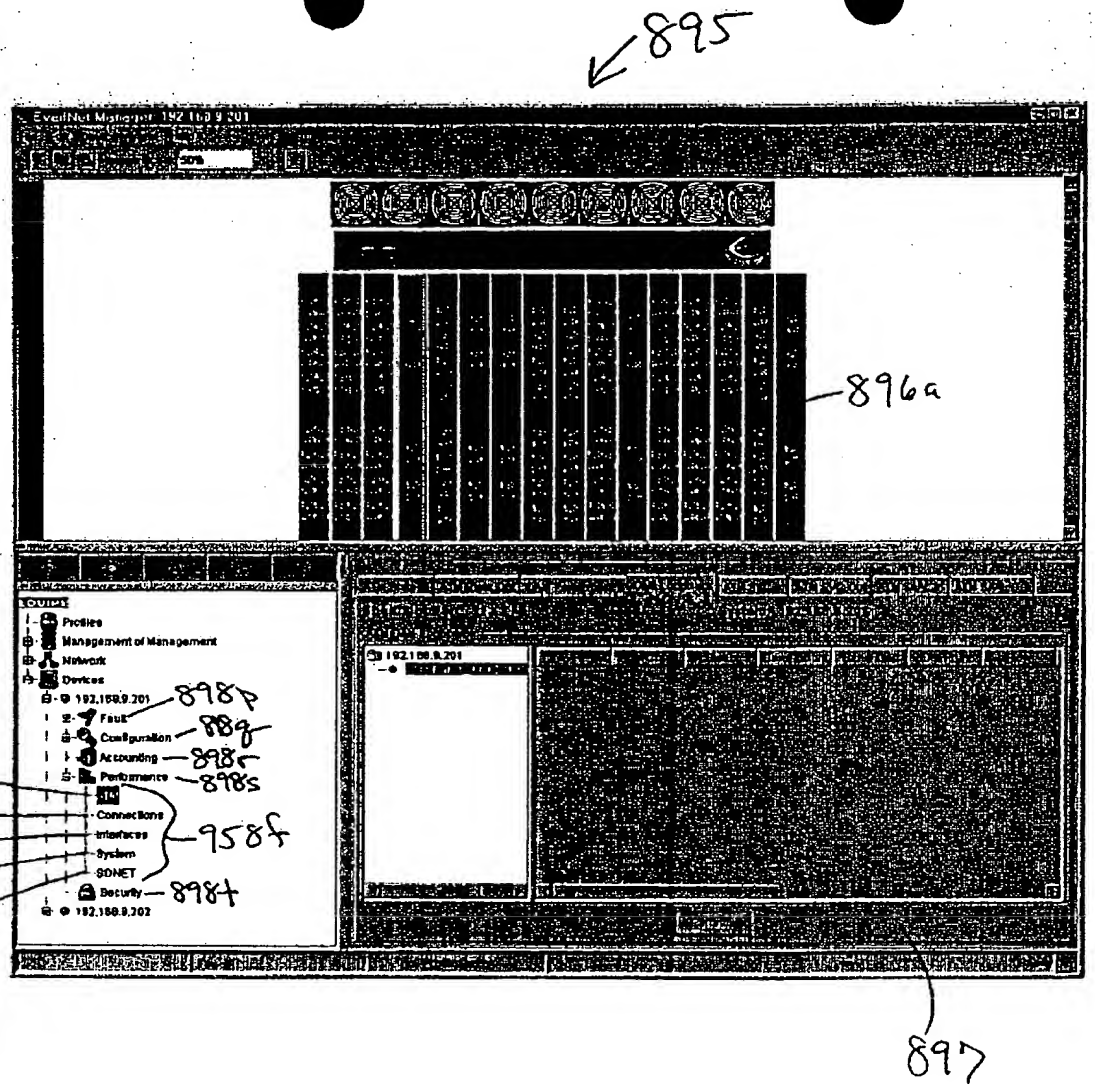
Fig. 7g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Profiles
Management of Management
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System
SONET
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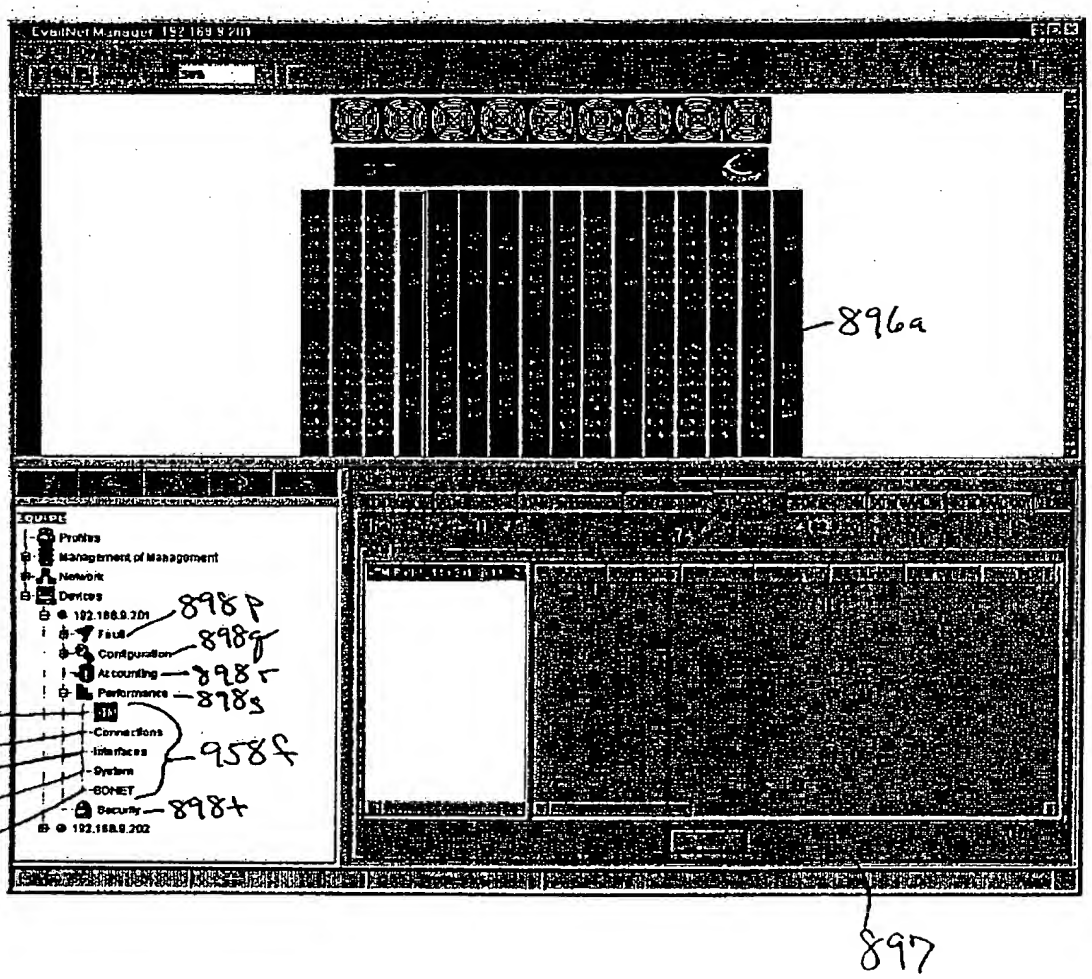
Fig. 7r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898p
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Management of Management
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Devices
Fault
Configuration
Accounting
Performance
Connections
Interfaces
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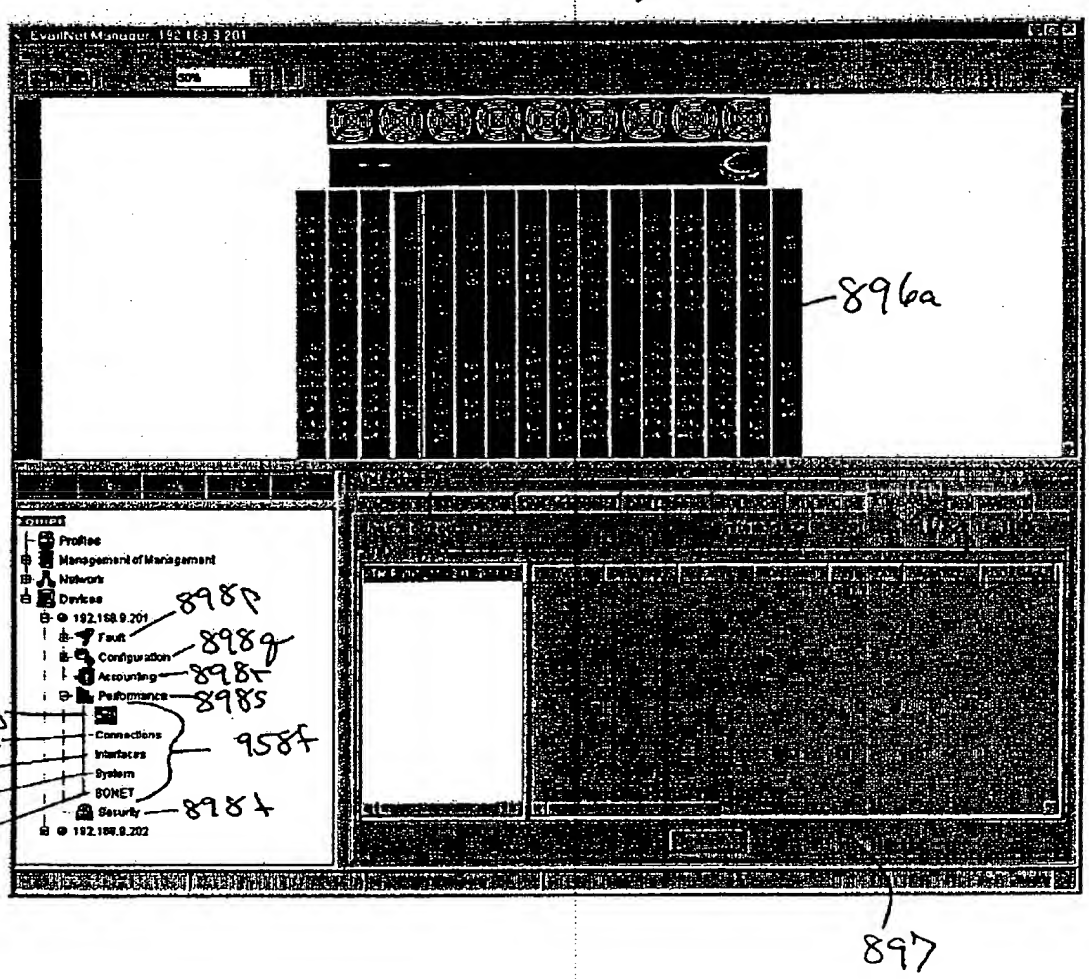
SONET
Security

Fig. 7s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Management of Management
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Connections
Interfaces
System
SONET
Security
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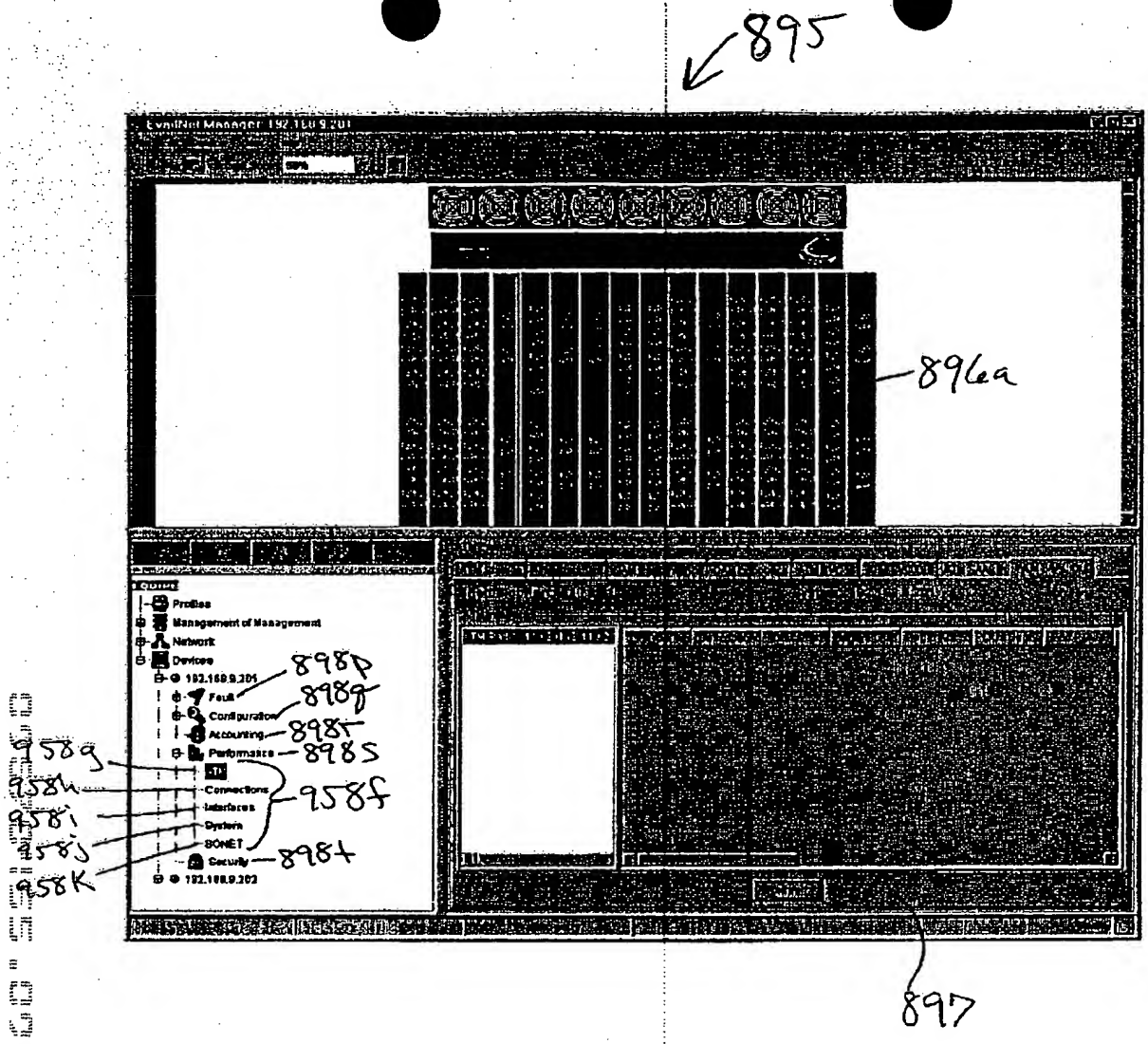
Fig. 7u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Probes
Management of Management
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Fault
Configuration
Accounting
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Connections
Interfaces
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SONET
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898s
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958K

Fig. 7v

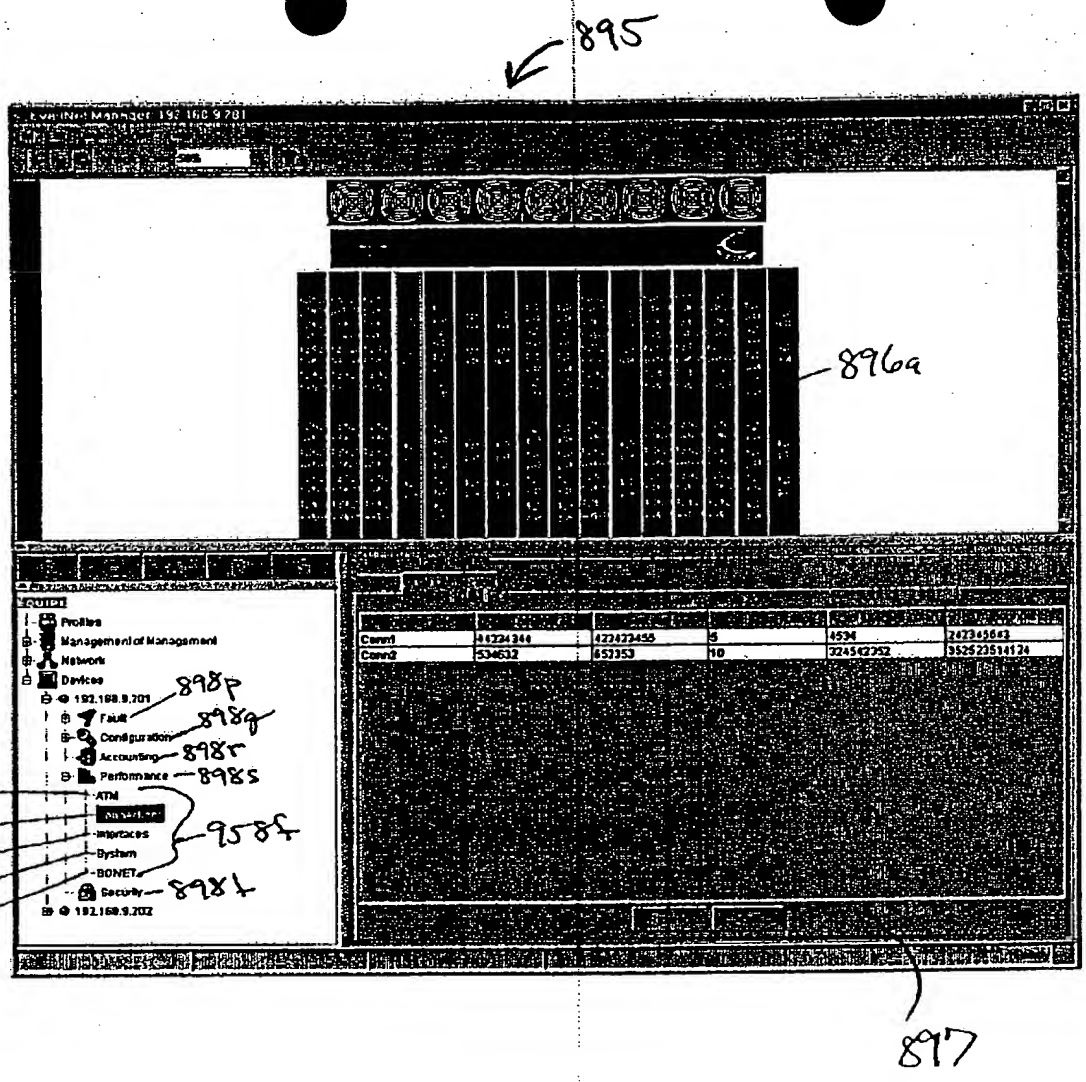
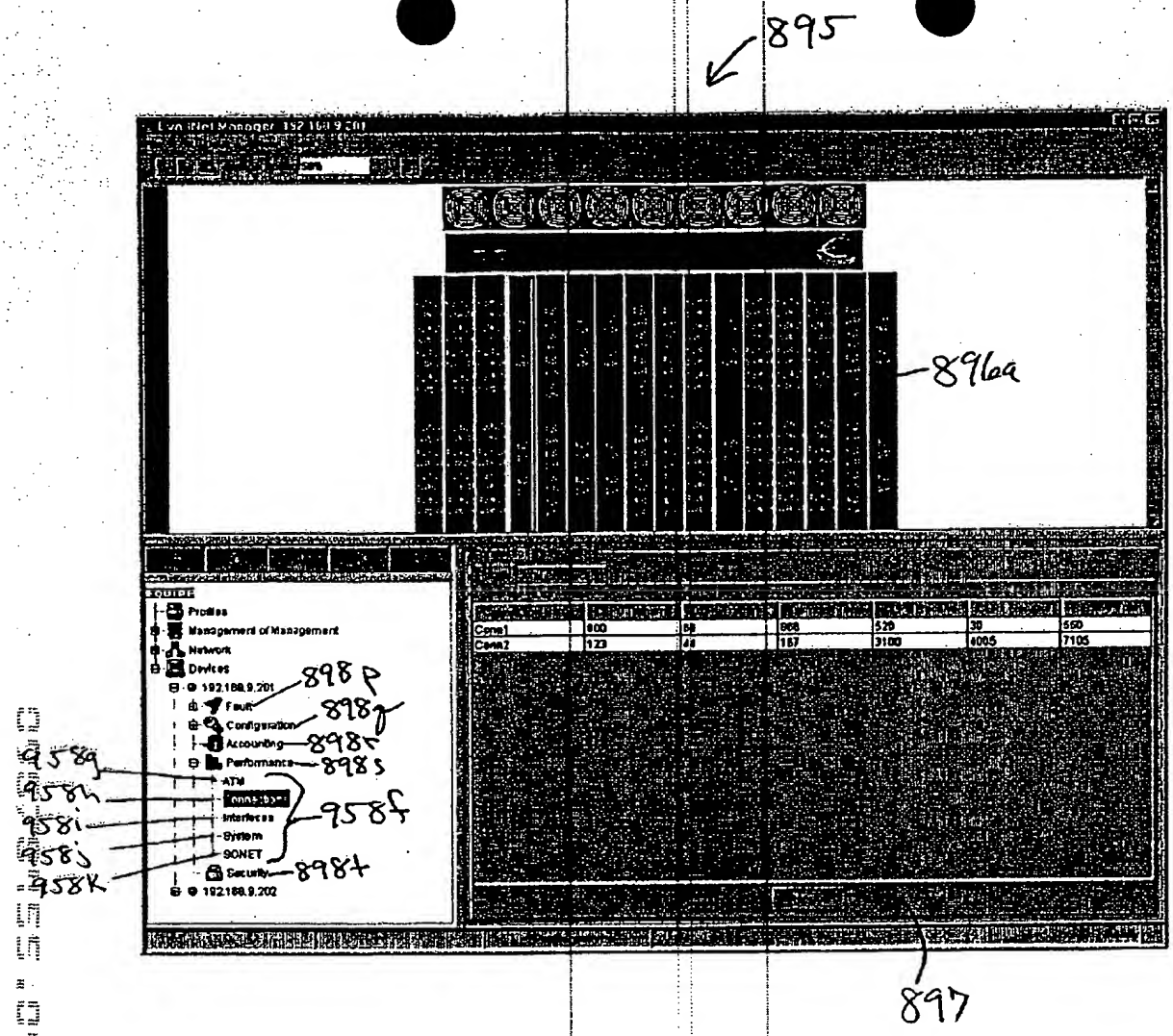


Fig. 7w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898p
898q
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958h
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958j
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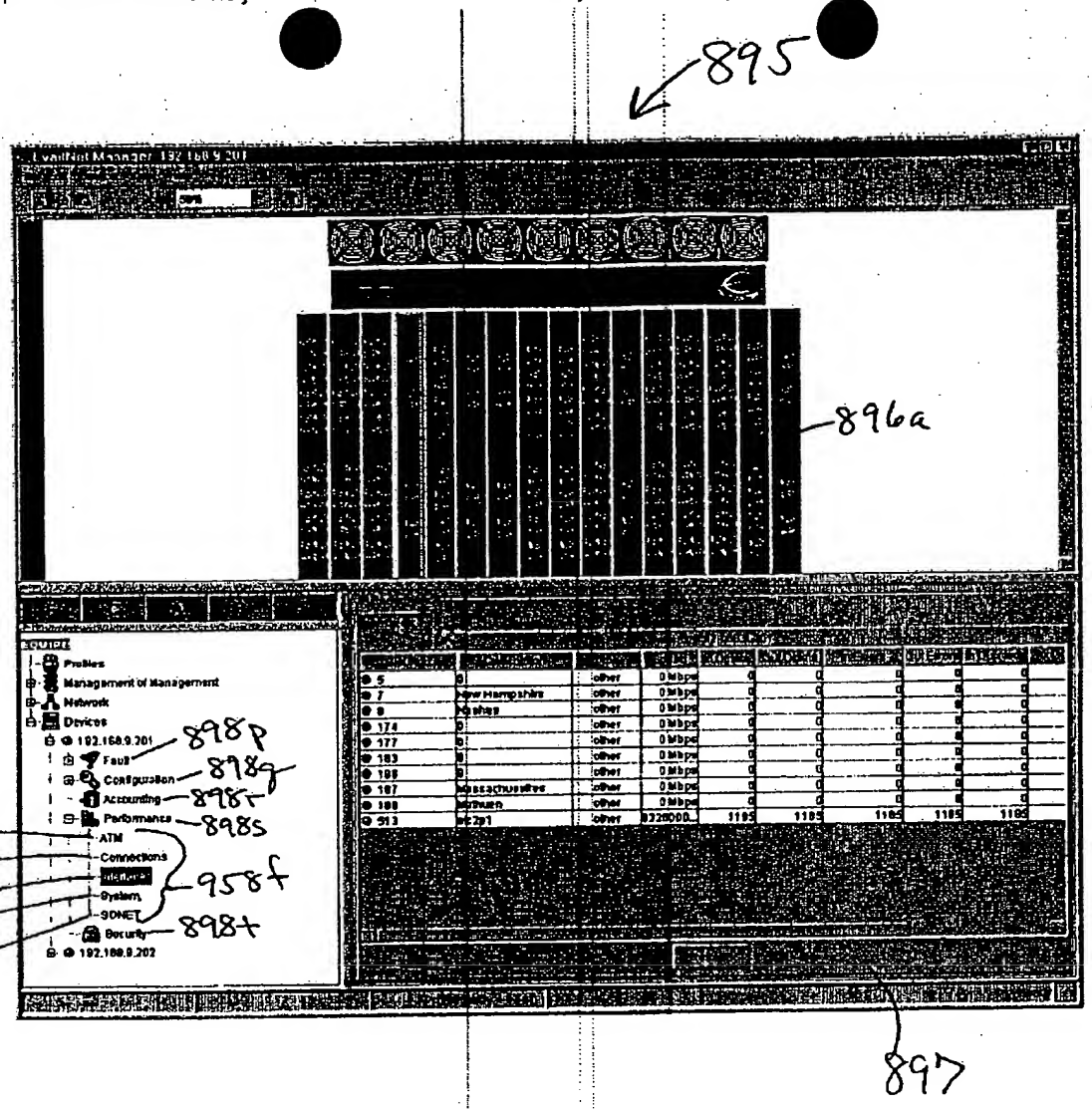
Profiles
Management of Management
Network
Devices
Fault
Configuration
Accounting
Performance
ATM
Interfaces
System
SONET
Security

Fig. 7x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896a
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898p
898q
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898s
898t
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958h
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958j
958k
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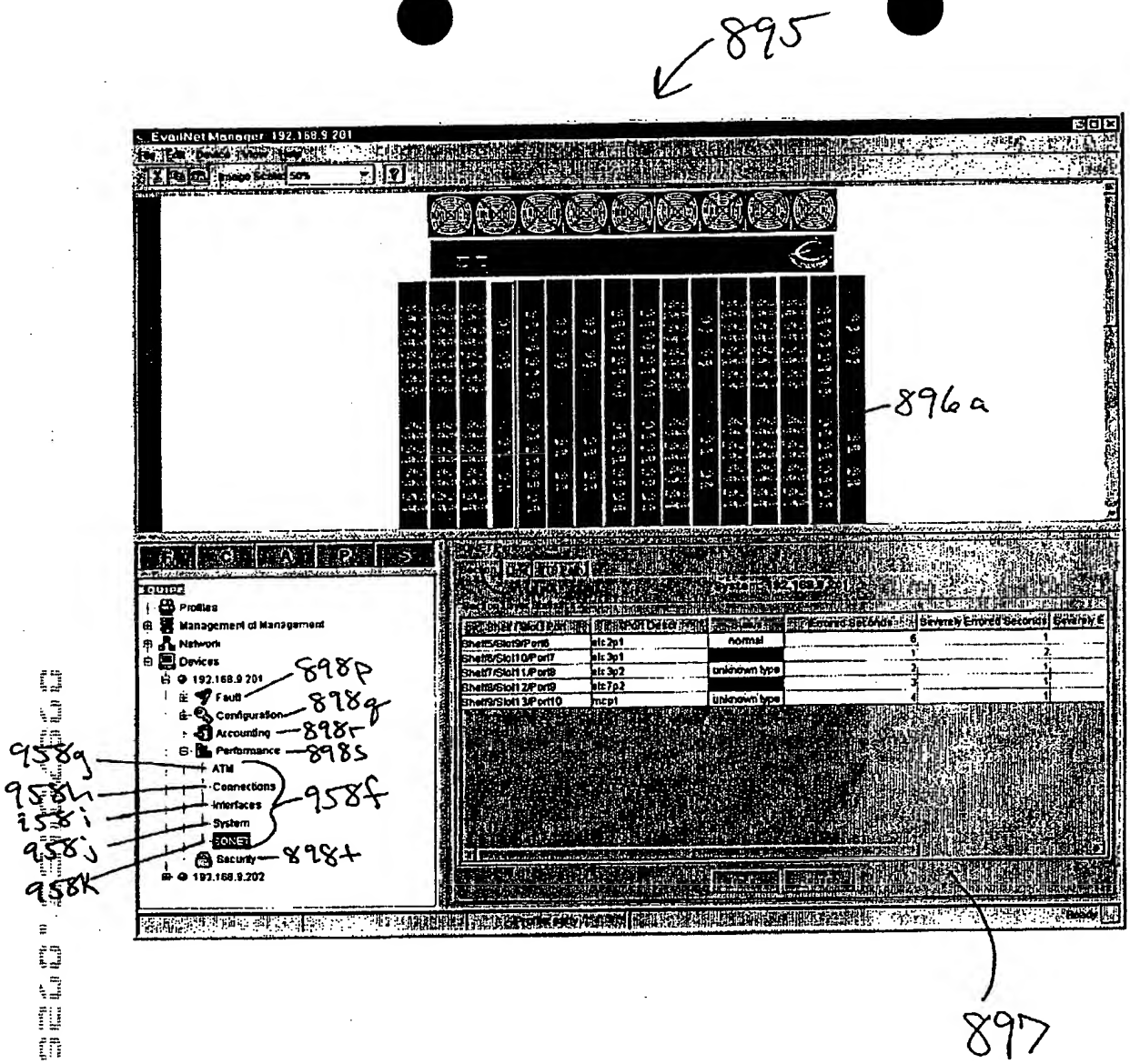
Profiles
Management of Management
Network
Devices
Fault
Configuration
Accounting
Performance
ATM
Connections
Interfaces
System
SONET
Security

Fig. 7Y


895
EvadNet Manager 192.168.9.201
896a
Profiles
Management of Management
Network
Devices
192.168.9.201
Fault
Configuration
Accounting
Performance
ATM
Connections
Interfaces
System
SONET
Security
192.168.9.202
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898q
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898t
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958h
958i
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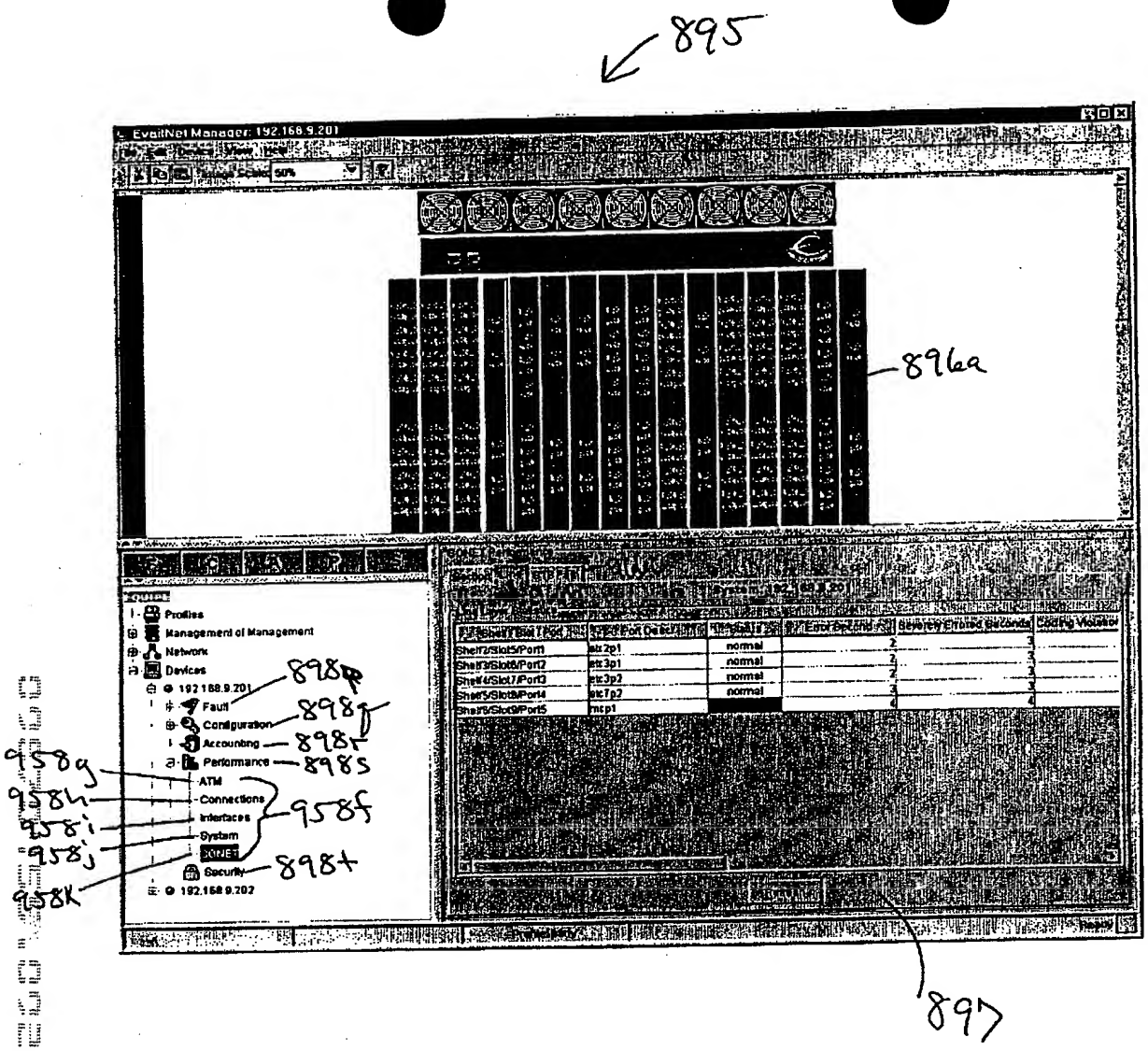
958k
958f
897

Fig. 8a


895
EventNet Manager: 192.168.9.201
896a
Profiles
Management of Management
Network
Devices
192.168.9.201
Fault
Configuration
Accounting
Performance
ATM
Connections
Interfaces
System
SONET
Security
192.168.9.202
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898t
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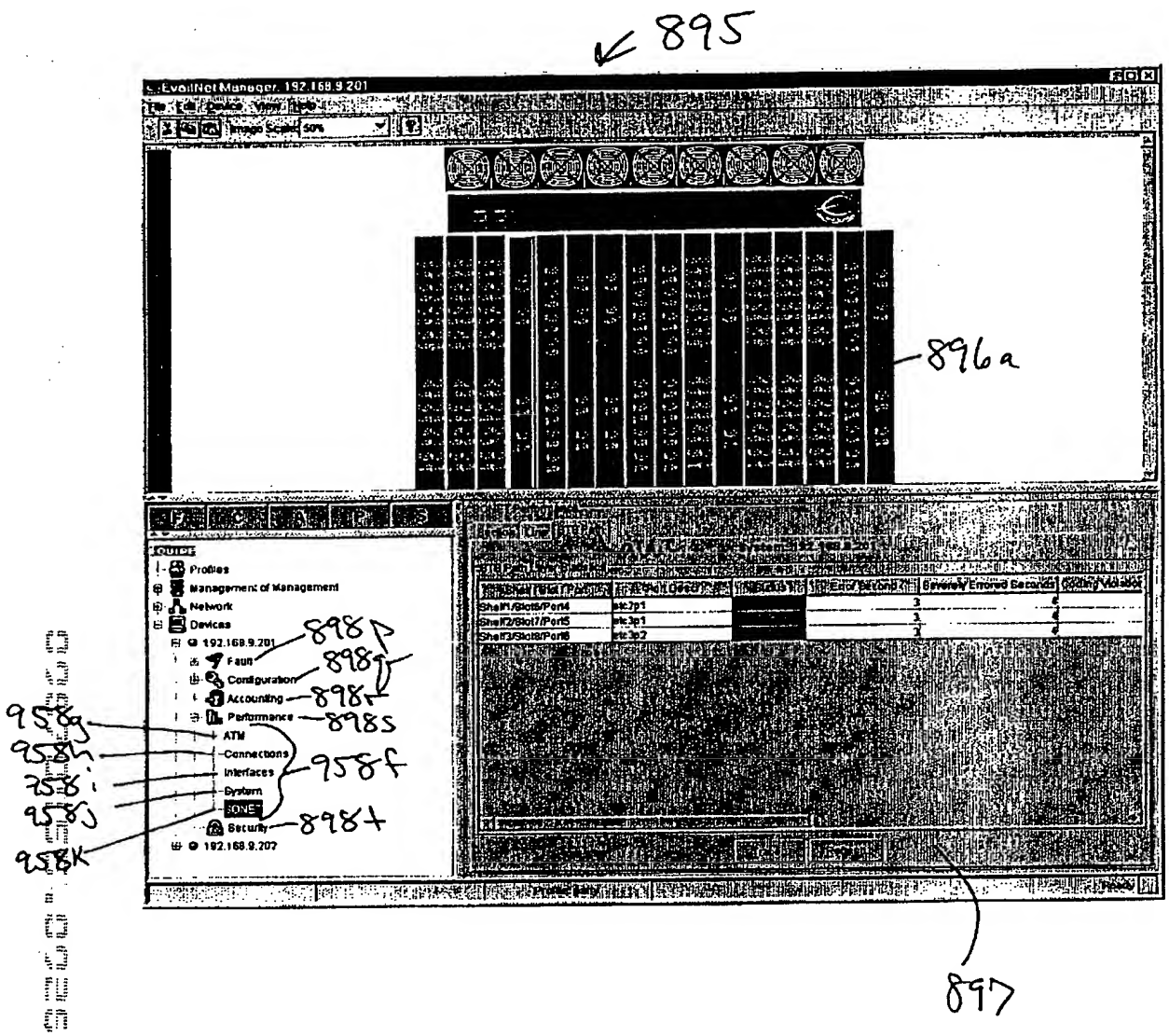
Fig. 8b


895
EvoliNet Manager 192.168.9.201
896a
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898
898
898f
898s
898t
958g
958h
958i
958j
958k
958f
Profiles
Management of Management
Network
Devices
192.168.9.201
Fault
Configuration
Accounting
Performance
ATM
Connections
Interfaces
System
SONET
Security
192.168.9.207

Fig. 8c

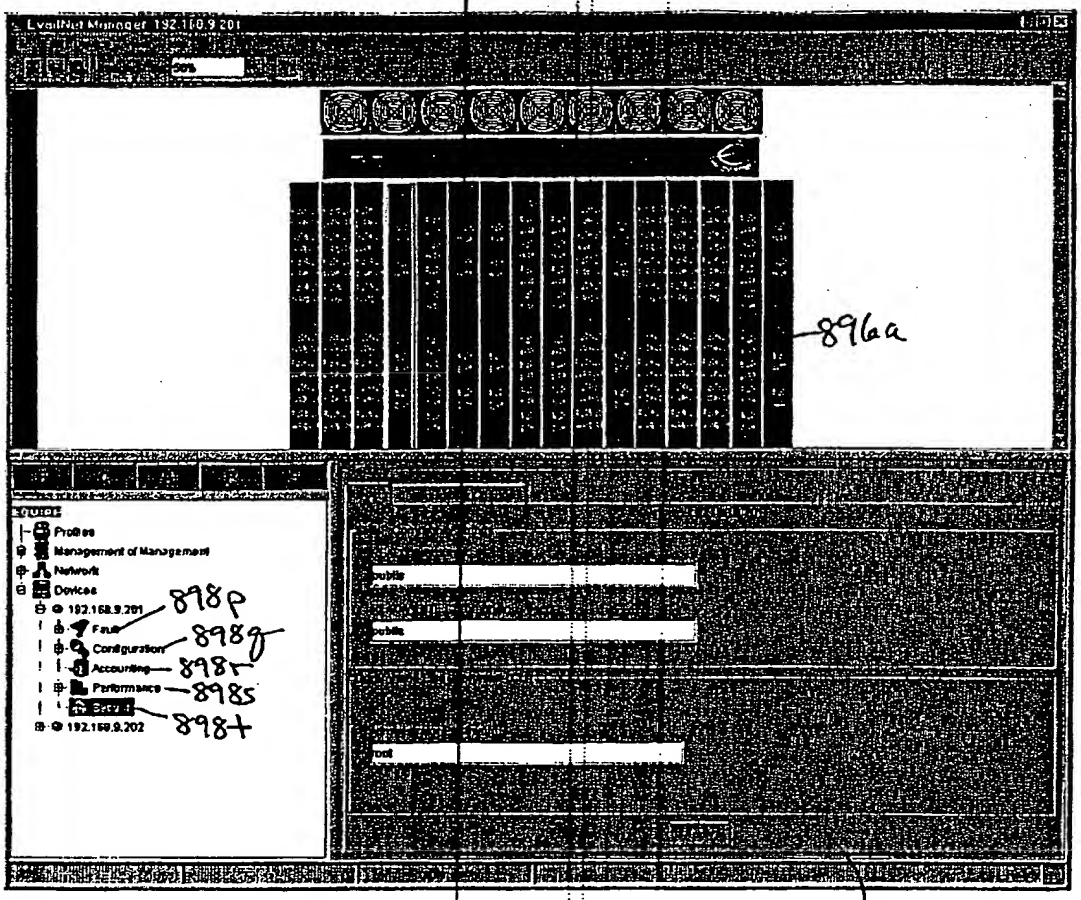


Fig. 8d

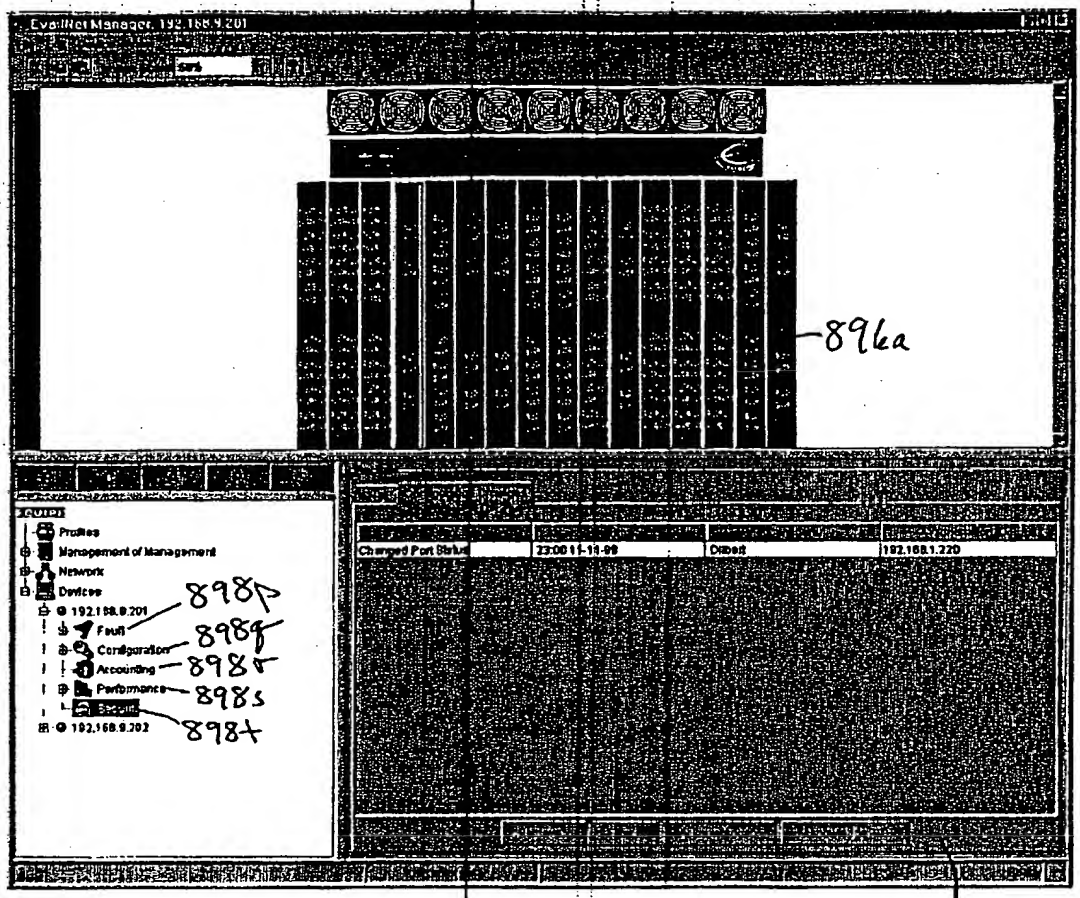
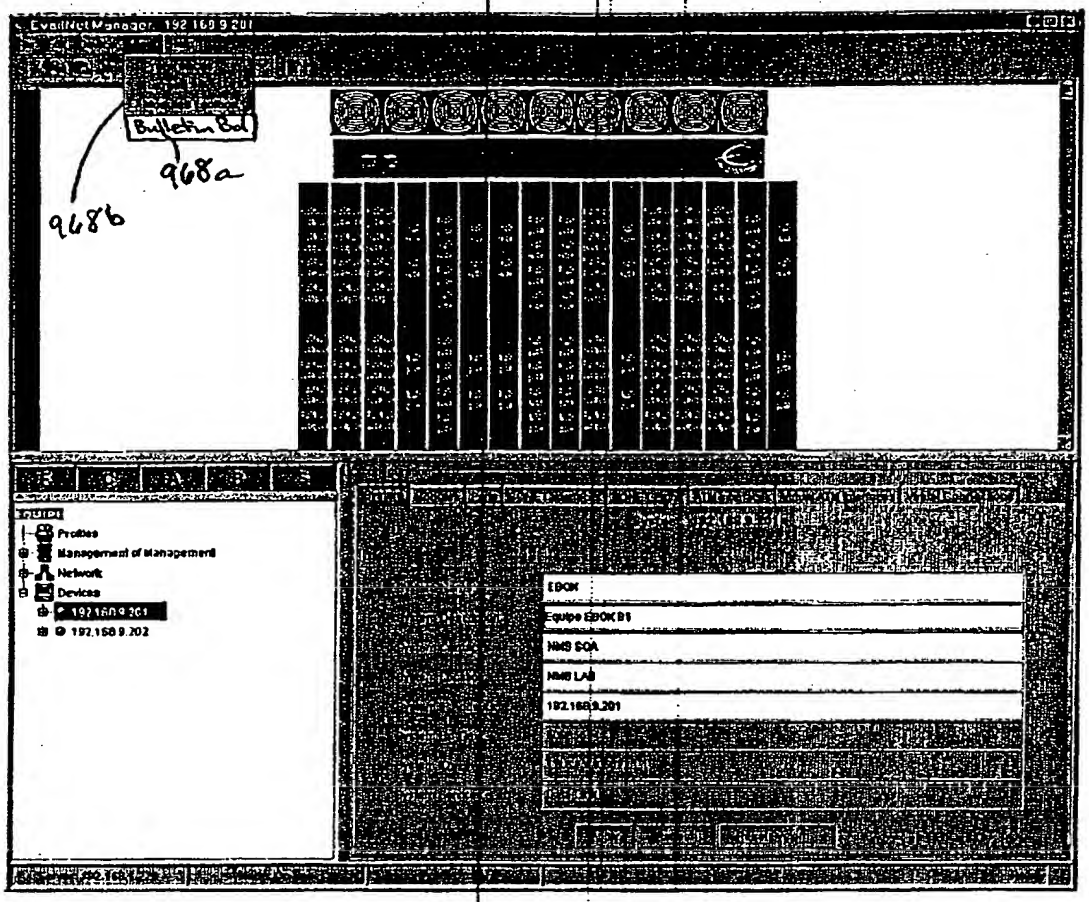

895
896a
Profiles
Management of Management
Network
Devices
192.168.9.201
Fault
Configuration
Accounting
Performance
Security
192.168.9.202
898a
898b
898c
898d
898e
898f
Changed Port Status
23:00:11-18-99
Other
192.168.1.220
897

Fig. 8e


895
968a
968b
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Management of Management
Network
Devices
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EDOM
Equipe EDOM B1
NMS SQA
NMS LAB
192.168.9.201

Fig. 9a

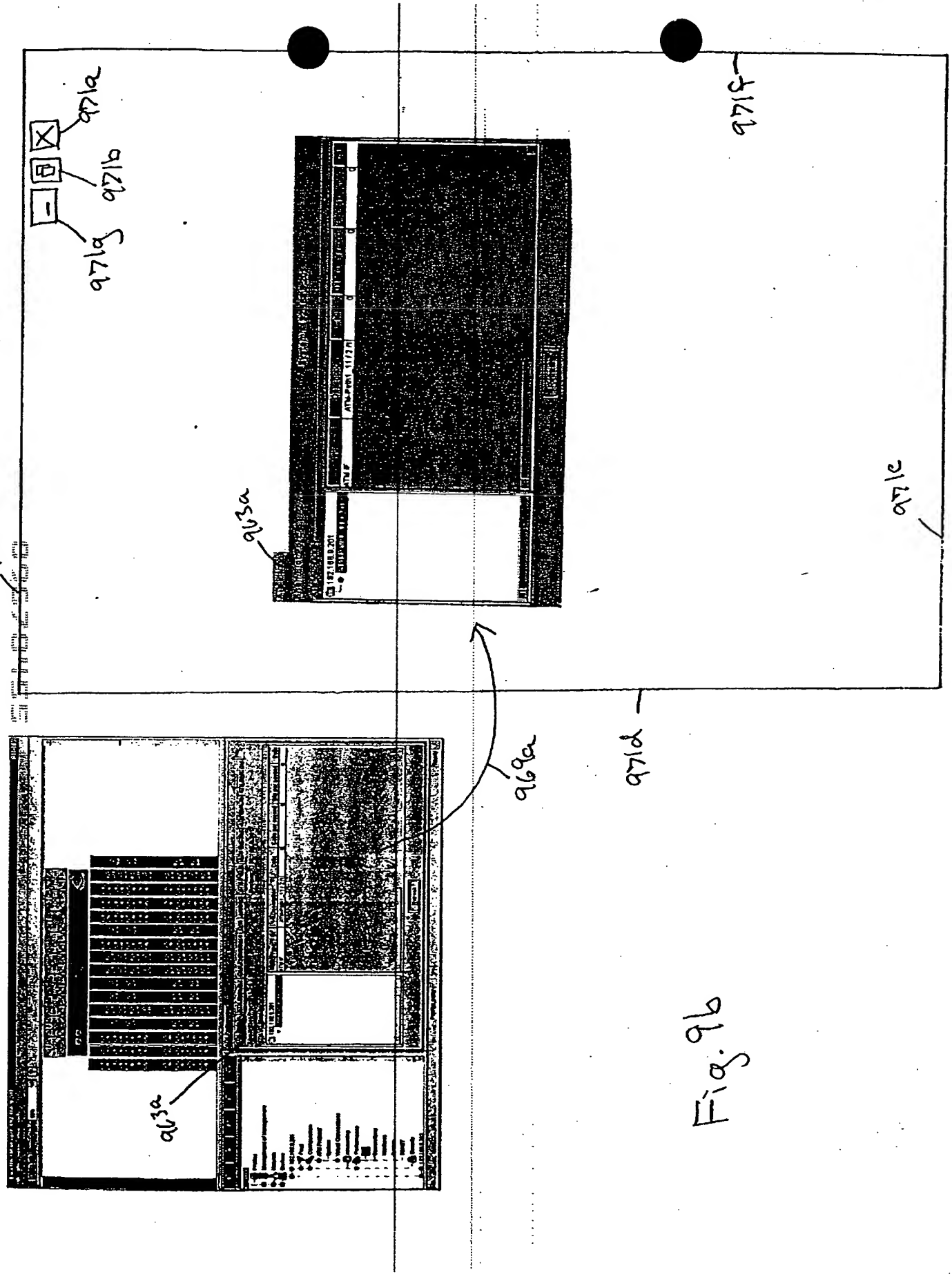


Fig. 9b

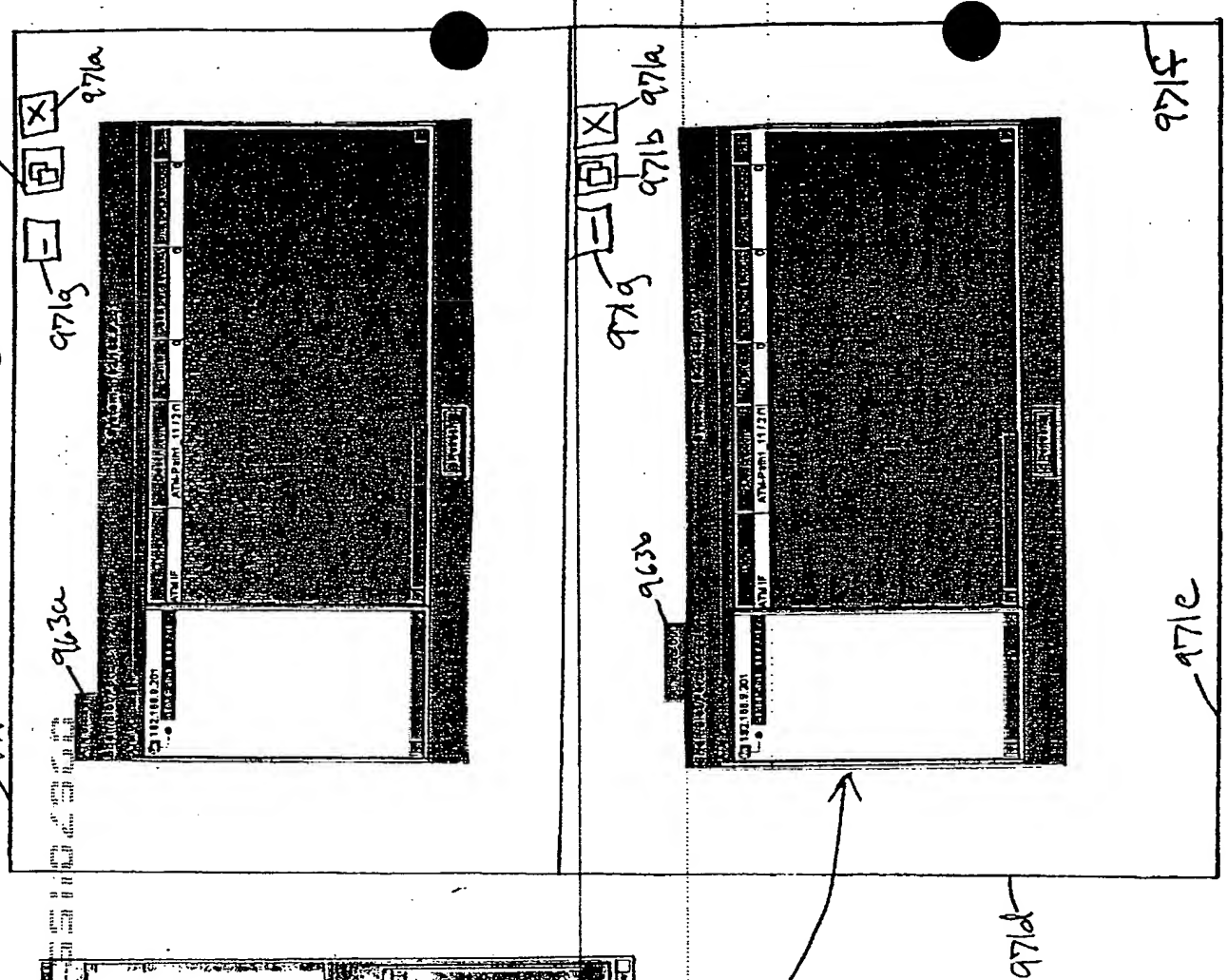


Fig. 9c

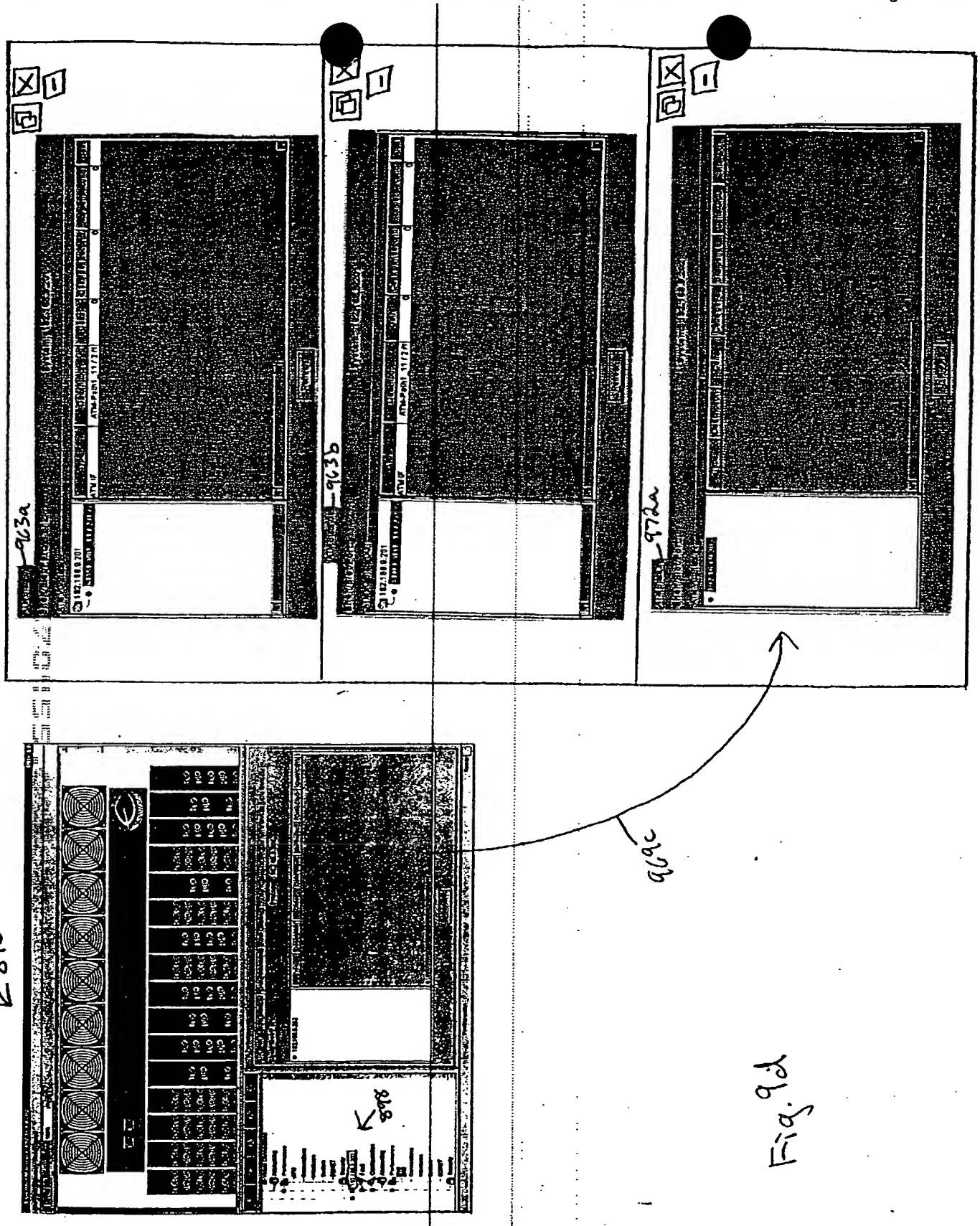


Fig. 9d

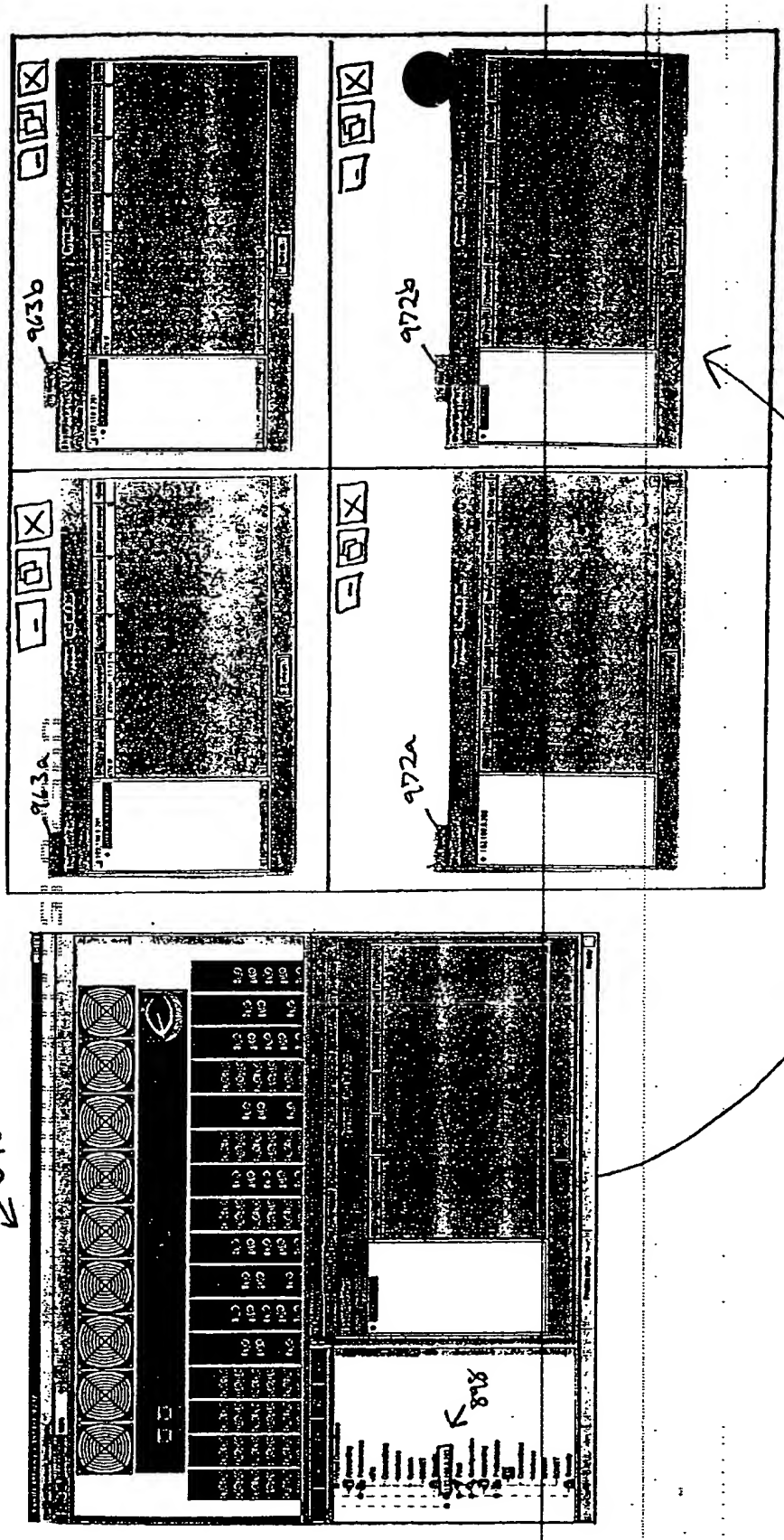


Fig. 9e.

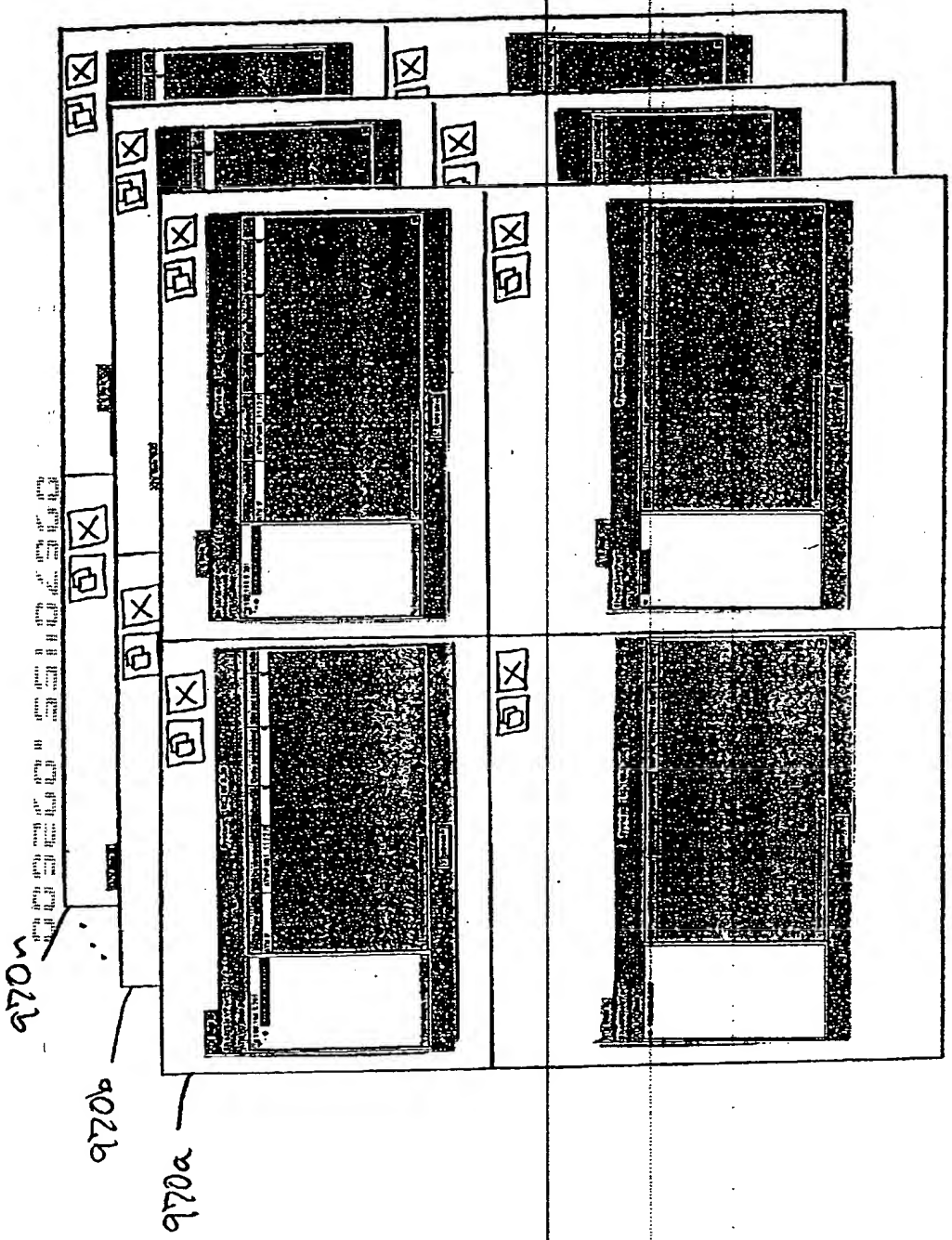


Fig. 9A

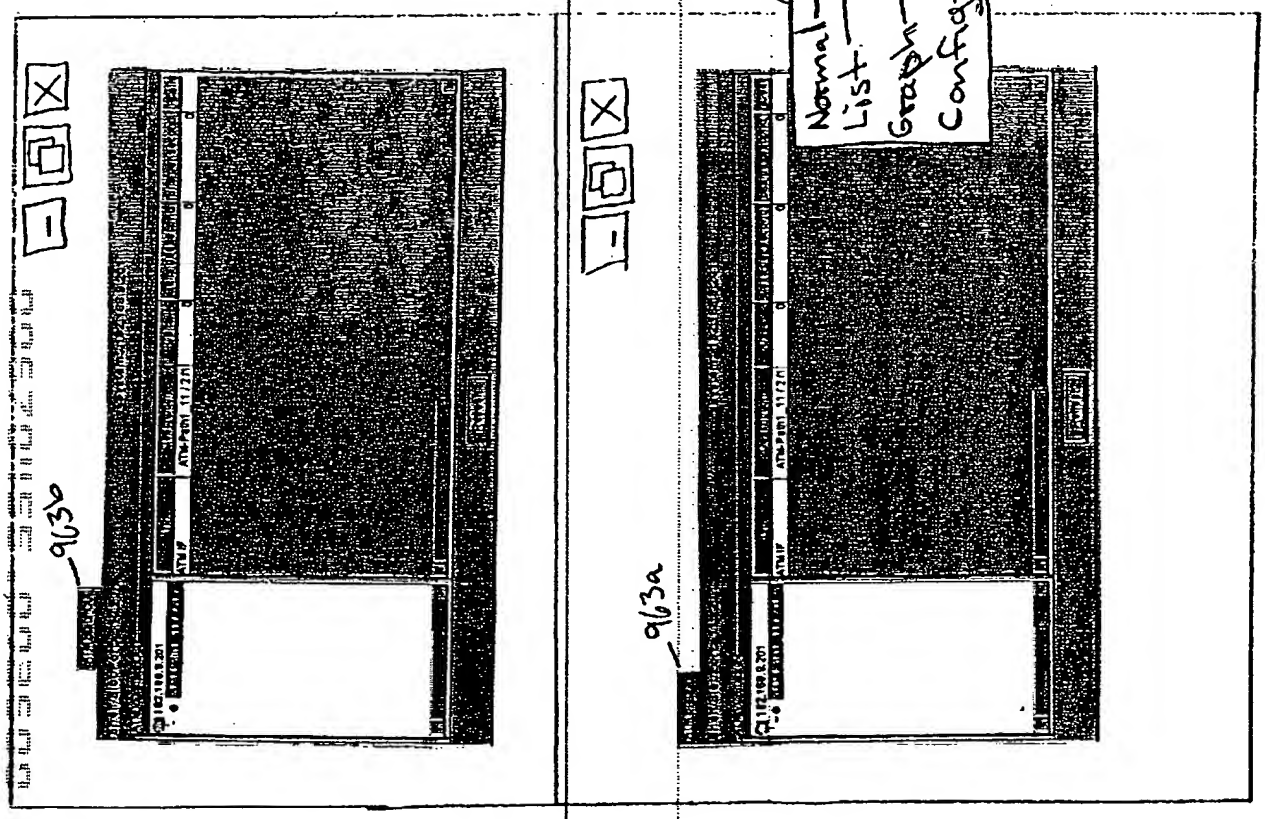

970a
963b
963a
973
973a
973b
973c
973d
Normal
List
Graph
Config

Fig. 9a

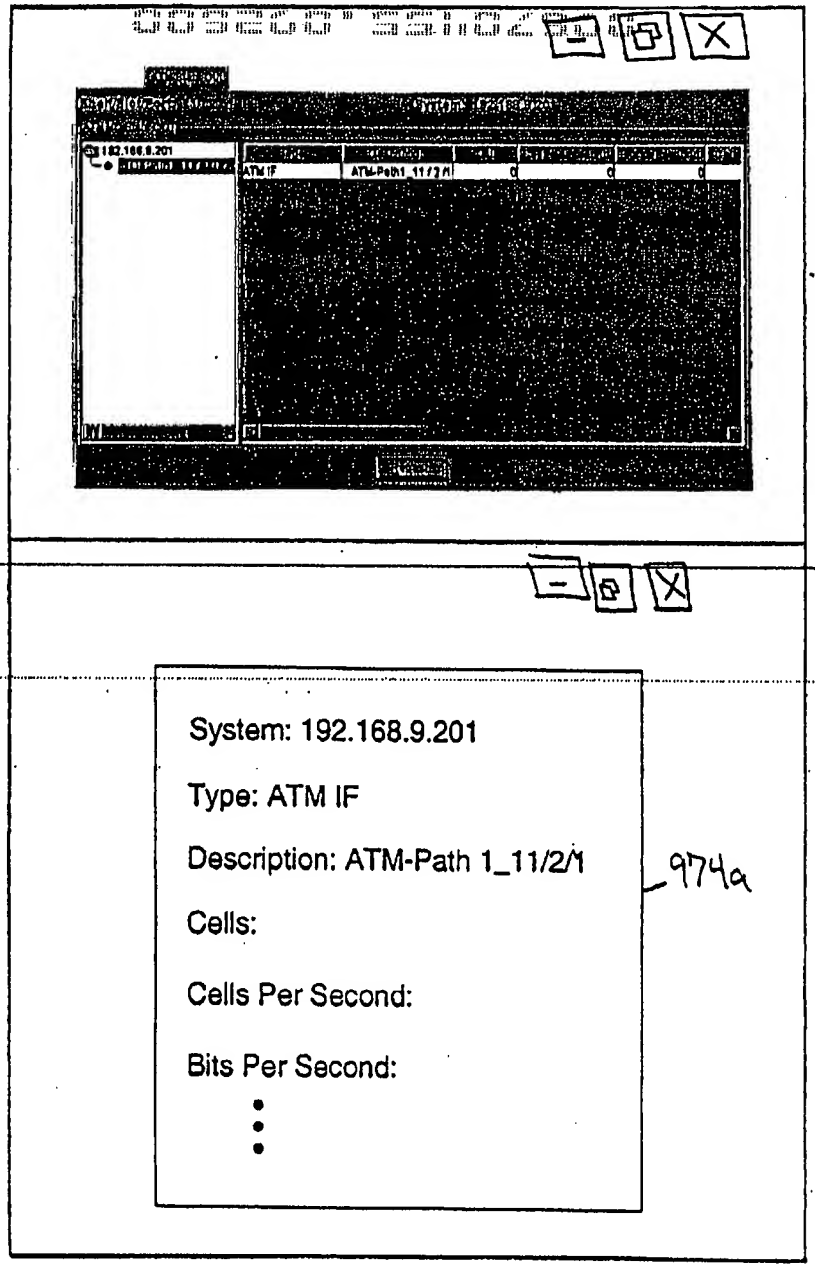

970a
192.168.9.201
ATM IF
ATM-Path1_11/2/1
0
0
0
System: 192.168.9.201
Type: ATM IF
Description: ATM-Path 1_11/2/1
Cells:
Cells Per Second:
Bits Per Second:
974a

Fig. 9h

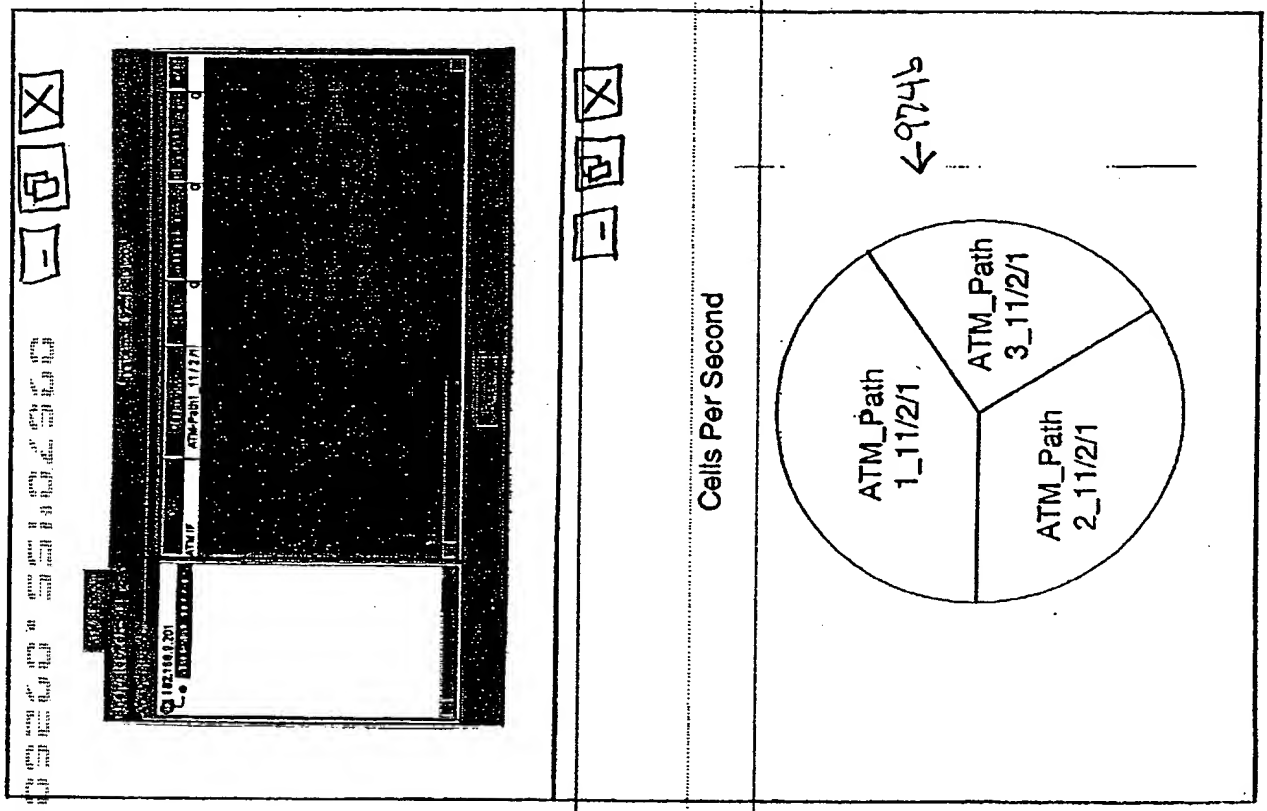

Cells Per Second
ATM_Path 1_11/2/1
ATM_Path 3_11/2/1
ATM_Path 2_11/2/1

Fig. 9

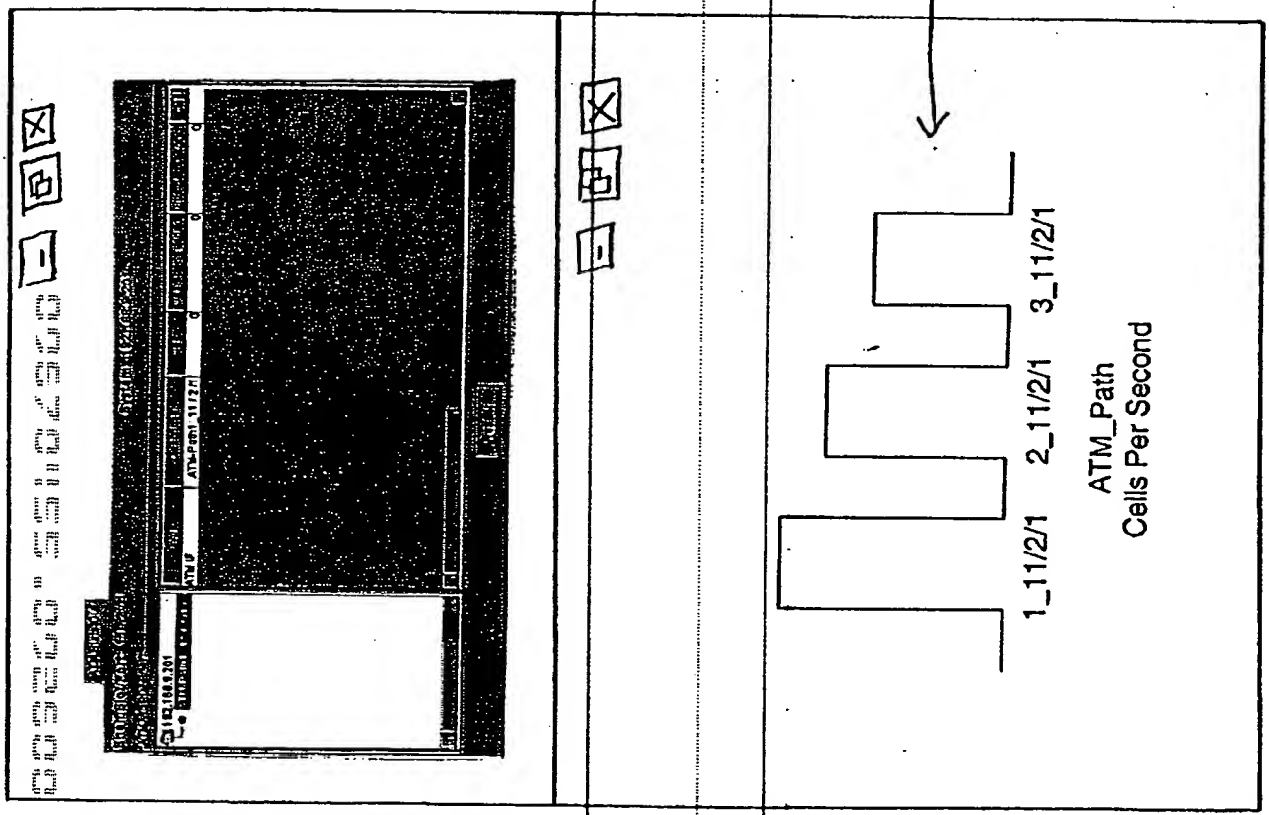
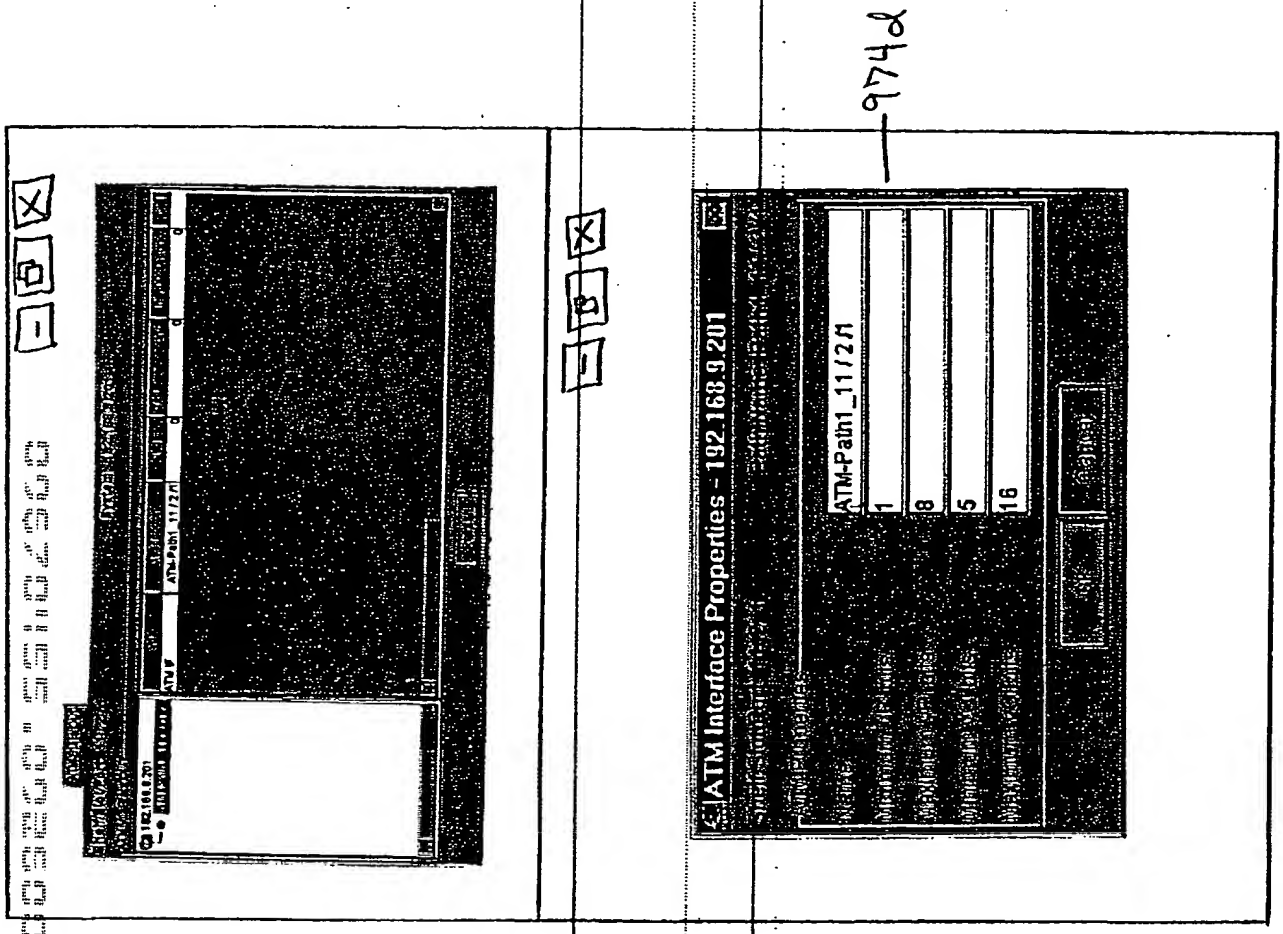


Fig. 9



9744

FIG. 9K

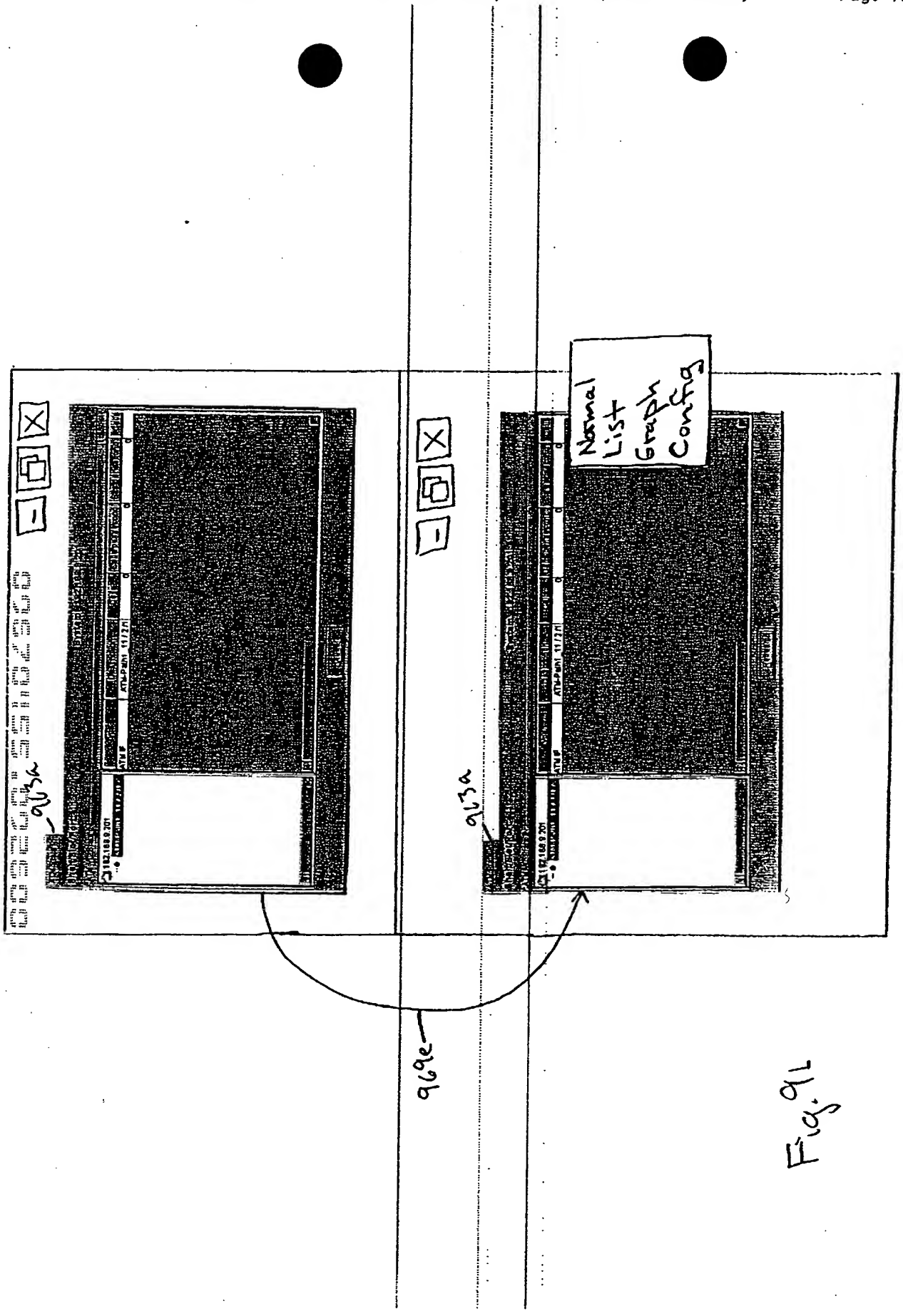


Fig. 9L

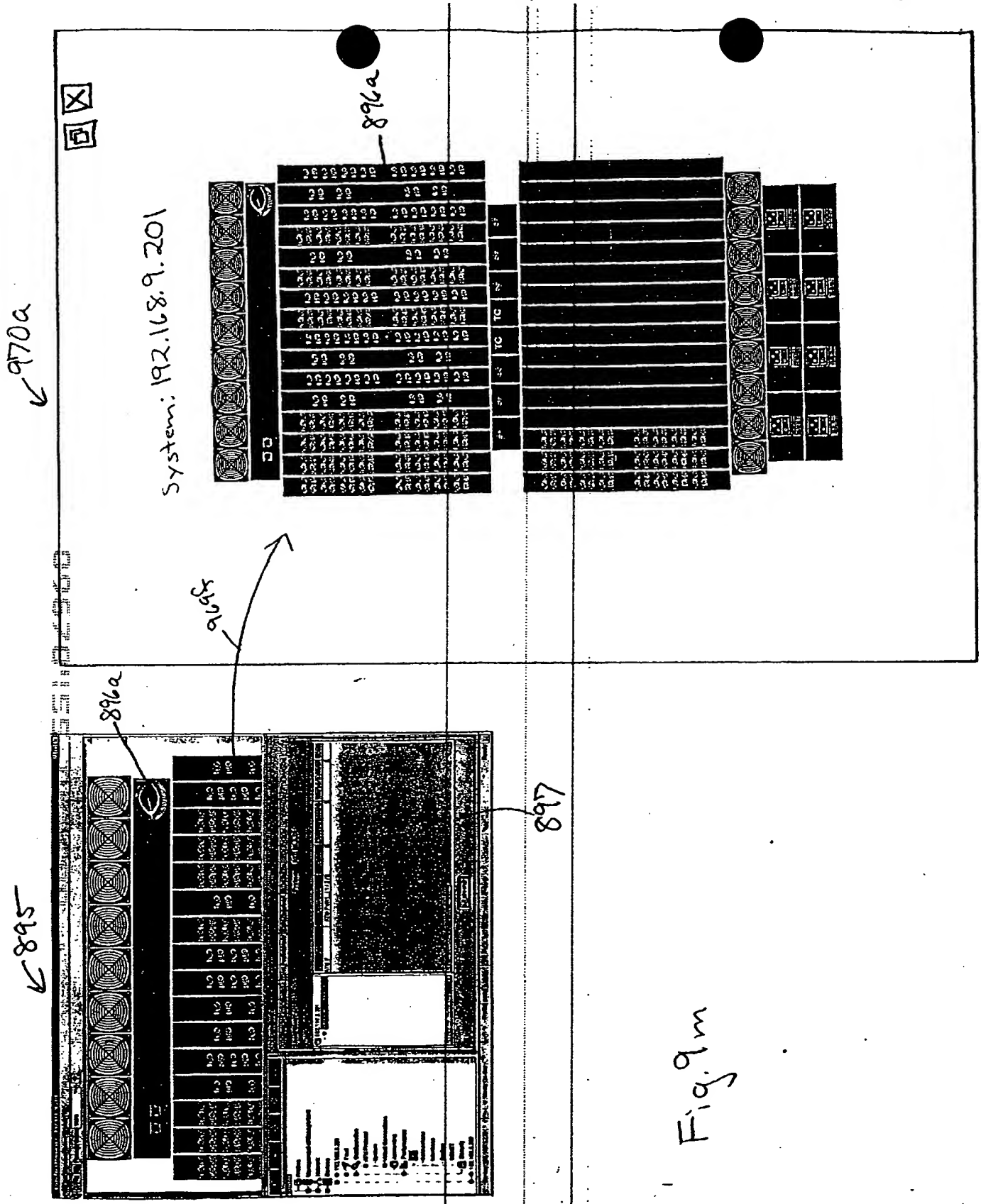


Fig. 9m

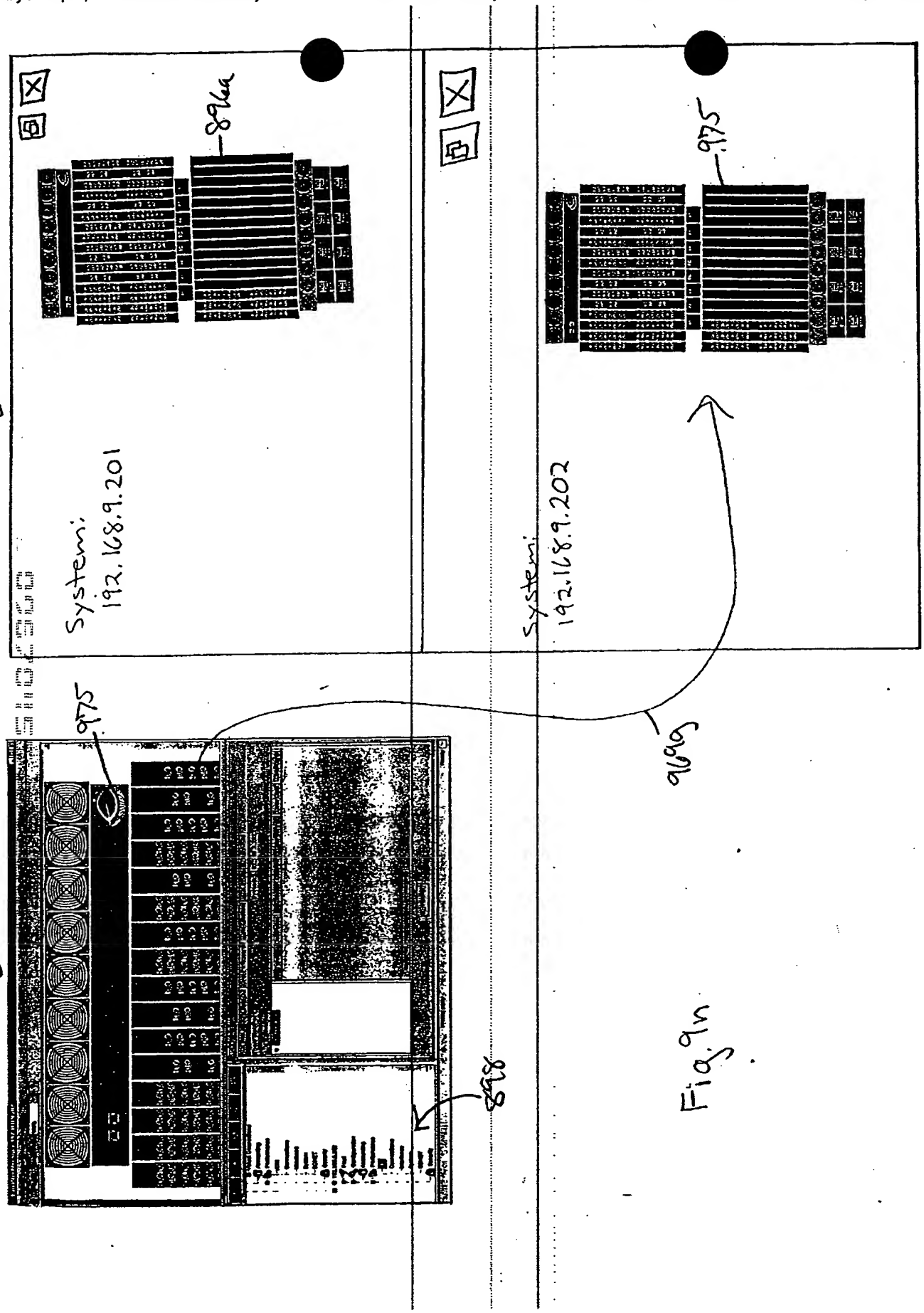

970a
896a
975
System:
192.168.9.201
System:
192.168.9.202
975
969a
895
898

Fig. 9n

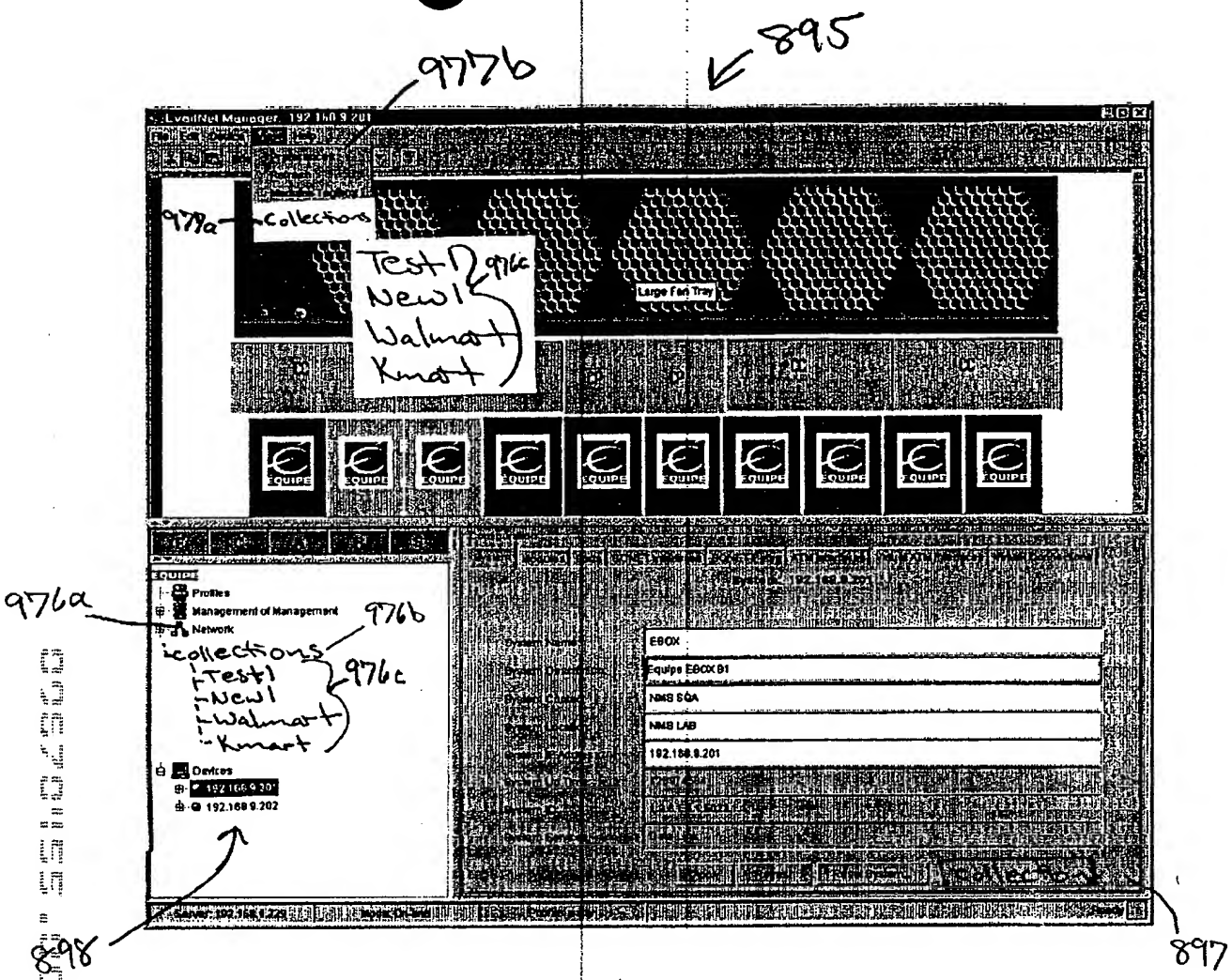

9776
895
976a
Collections
Test1
New1
Walmart
Kmart
976c
Large Fwd Tray
976a
976b
Profiles
Management of Management
Network
Collections
Test1
New1
Walmart
Kmart
976c
Devices
192.168.9.202
EBOX
Equipe EBOX B1
NMS SQA
NMS LAB
192.168.9.201
898
897

Fig.10a

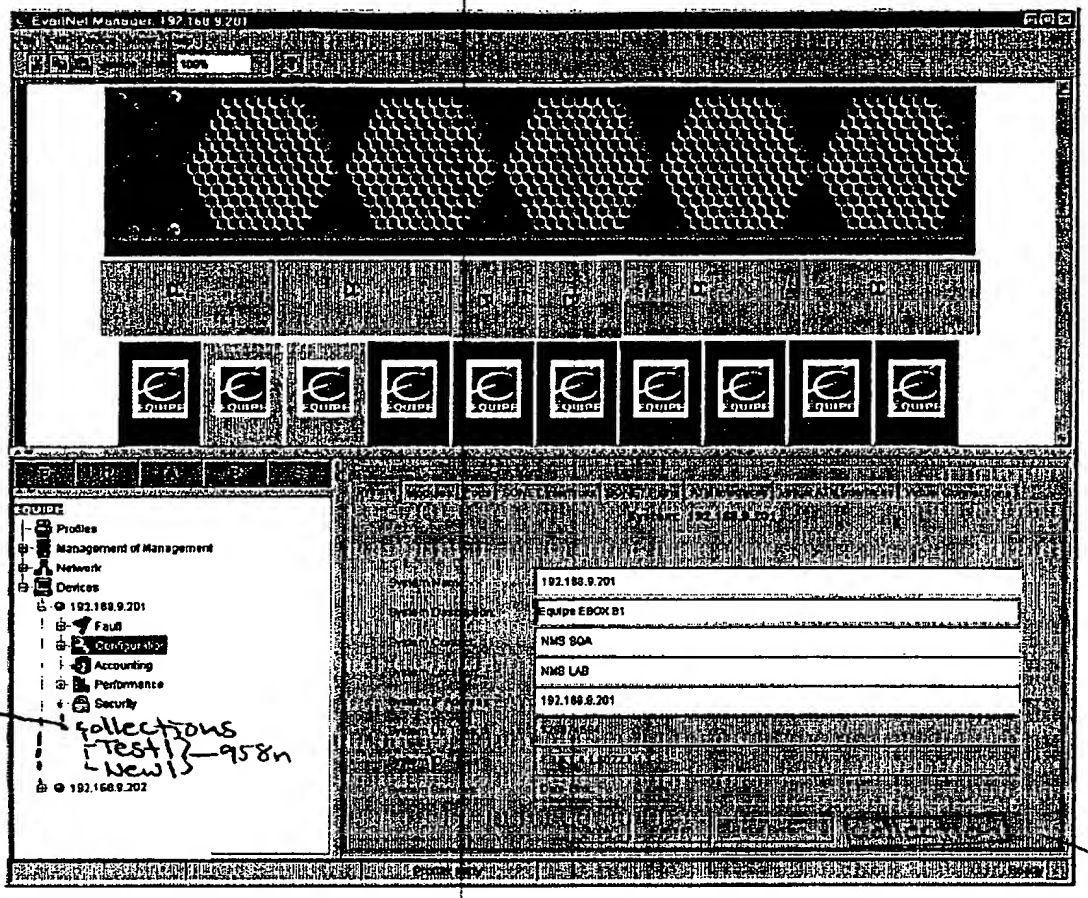

895
EvalNet Manager 192.168.9.201
Profiles
Management of Management
Network
Devices
192.168.9.201
Fault
Configuration
Accounting
Performance
Security
192.168.9.202
958m
collections
Test
News
958n
192.168.9.201
Equipe EBOX B1
NMS SQA
NMS LAB
192.168.9.201
897

Fig. 10b

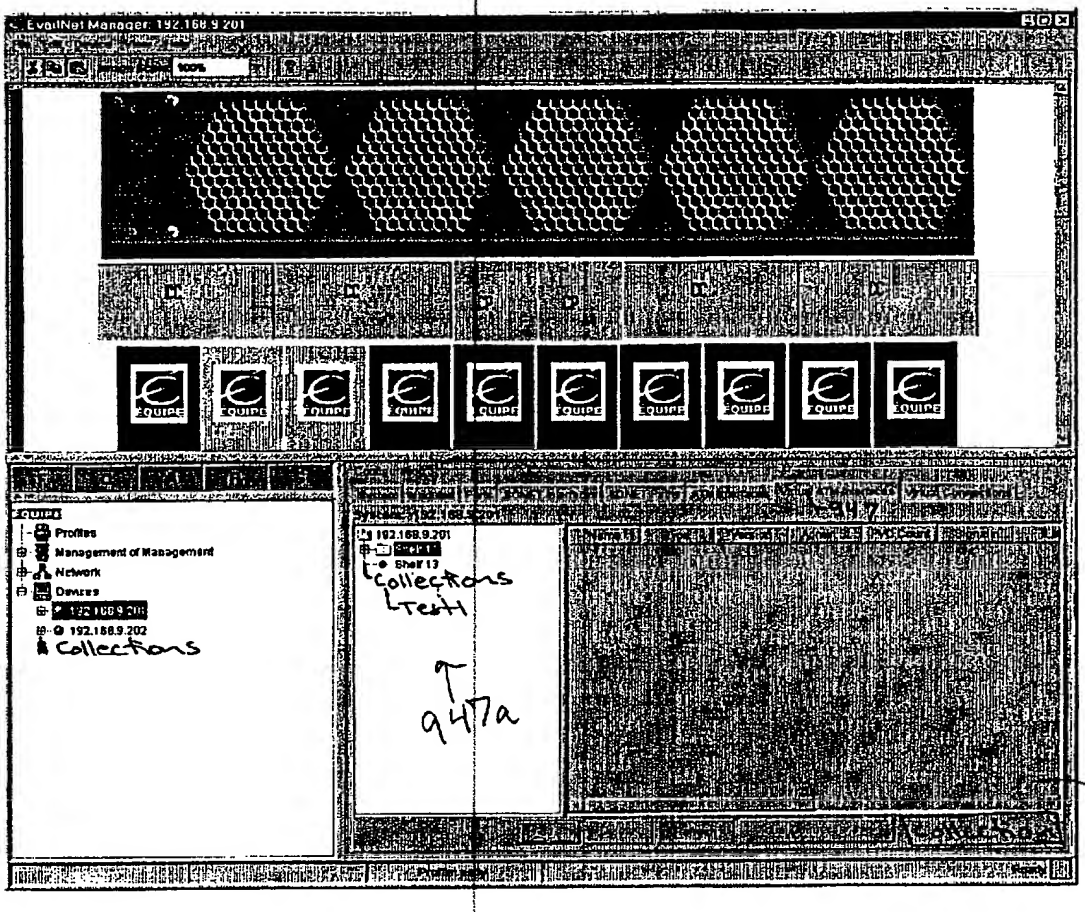

EvaulNet Manager 192.168.9.201
Profiles
Management of Management
Network
Devices
192.168.9.201
192.168.9.202
Collections
192.168.9.201
Shelf 13
Collections
Tests
947a
947
897

Fig. 10c

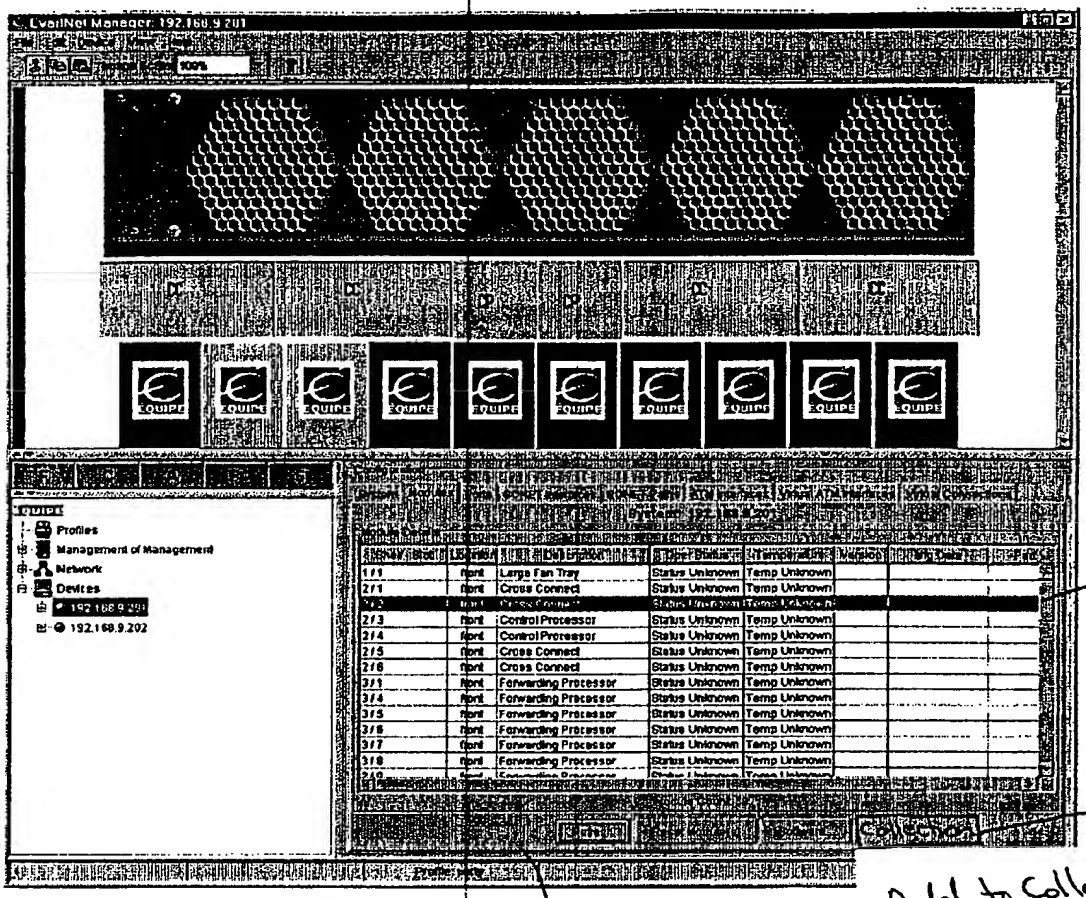


Fig. 10d

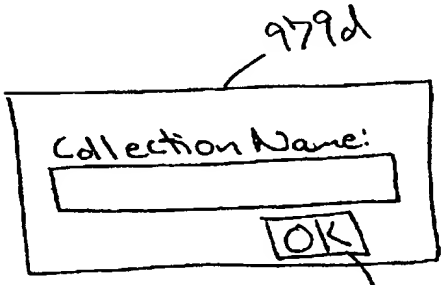


Fig. 10e

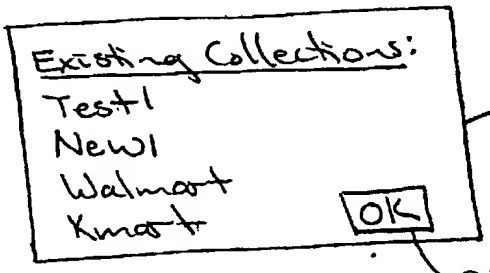


Fig. 10f

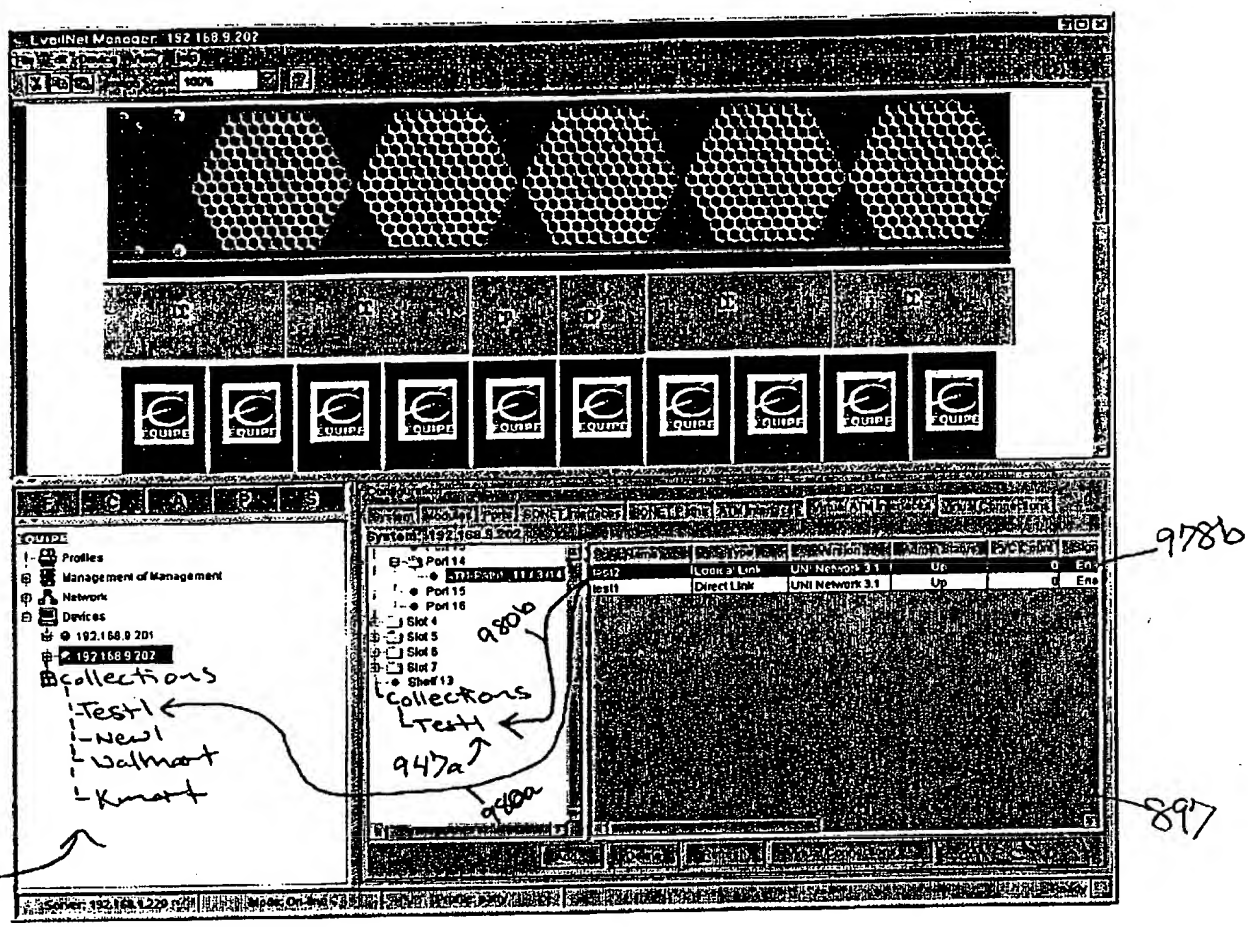

895
EquipeNet Manager 192.168.9.202
Profiles
Management of Management
Network
Devices
192.168.9.201
192.168.9.202
collections
Test1
New1
Walmart
Kmart
898
Port 14
Port 15
Port 16
Slot 4
Slot 5
Slot 6
Slot 7
Shelf 13
collections
Test1
9800
947a
9786
897
Direct Link
UNI Network 3.1
Up

Fig. 10g

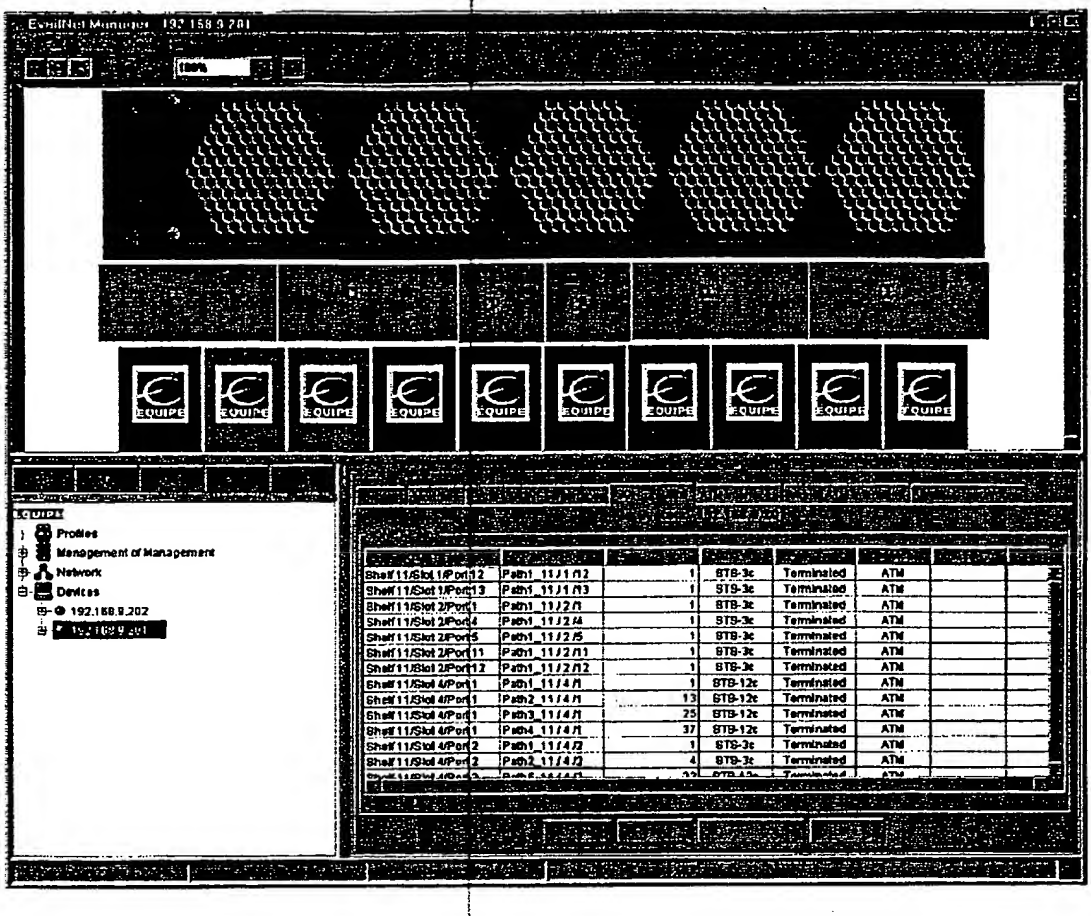

Profiles
Management of Management
Network
Devices
192.168.9.202

Fig. 10h

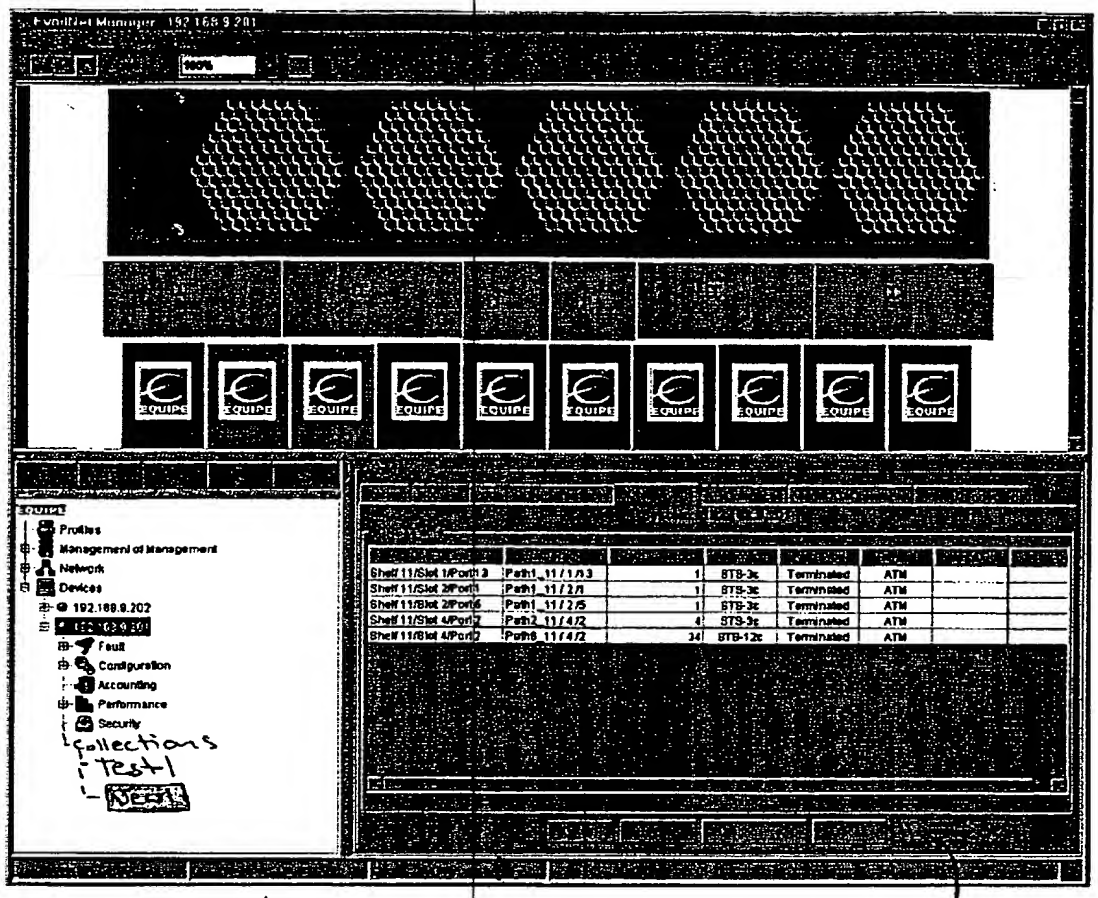

EQUIPE
Profiles
Management of Management
Network
Devices
192.168.9.202
Fault
Configuration
Accounting
Performance
Security
Collections
Test1
Next
982

Fig. 10i

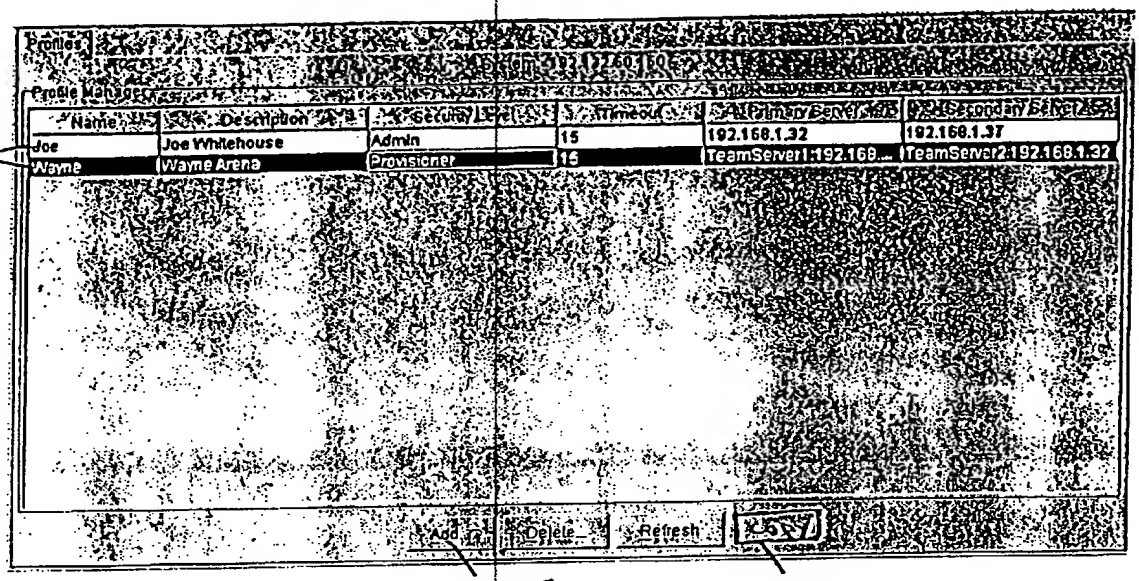

Profiles
Profile Manager
Name
Description
Security Level
Timeout
Primary Server
Secondary Server
Joe
Joe Whitehouse
Admin
15
192.168.1.32
192.168.1.37
Wayne
Wayne Arena
Provisioner
15
TeamServer1:192.168...
TeamServer2:192.168.1.32
Add
Delete
Refresh
Close
904
905
906

Fig. 11a

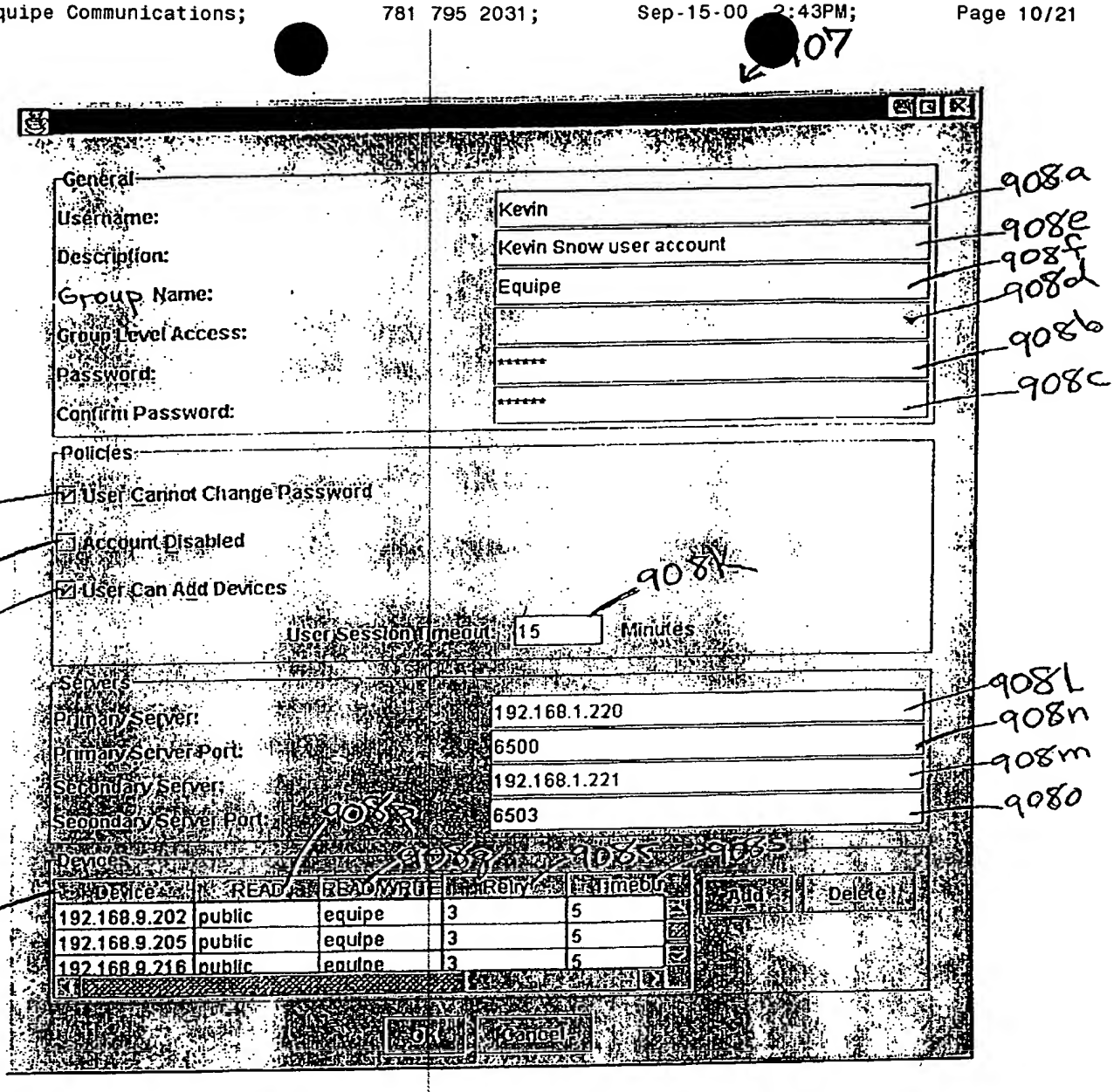

907
General
Username:
Kevin
Description:
Kevin Snow user account
Group Name:
Equipe
Group Level Access:
Password:
******
Confirm Password:
******
908a
908e
908f
908d
908b
908c
Policies
User Cannot Change Password
Account Disabled
User Can Add Devices
908g
908i
908j
908k
User Session Timeout:
15
Minutes
Servers
Primary Server:
192.168.1.220
Primary Server Port:
6500
Secondary Server:
192.168.1.221
Secondary Server Port:
6503
908l
908n
908m
908o
Devices
Device
READ
READ/WRITE
Retry
Timeout
Add
Delete
192.168.9.202
public
equipe
3
5
192.168.9.205
public
equipe
3
5
192.168.9.216
public
equipe
3
5
908q
OK
Cancel

Fig. 11b

Fig. 11c

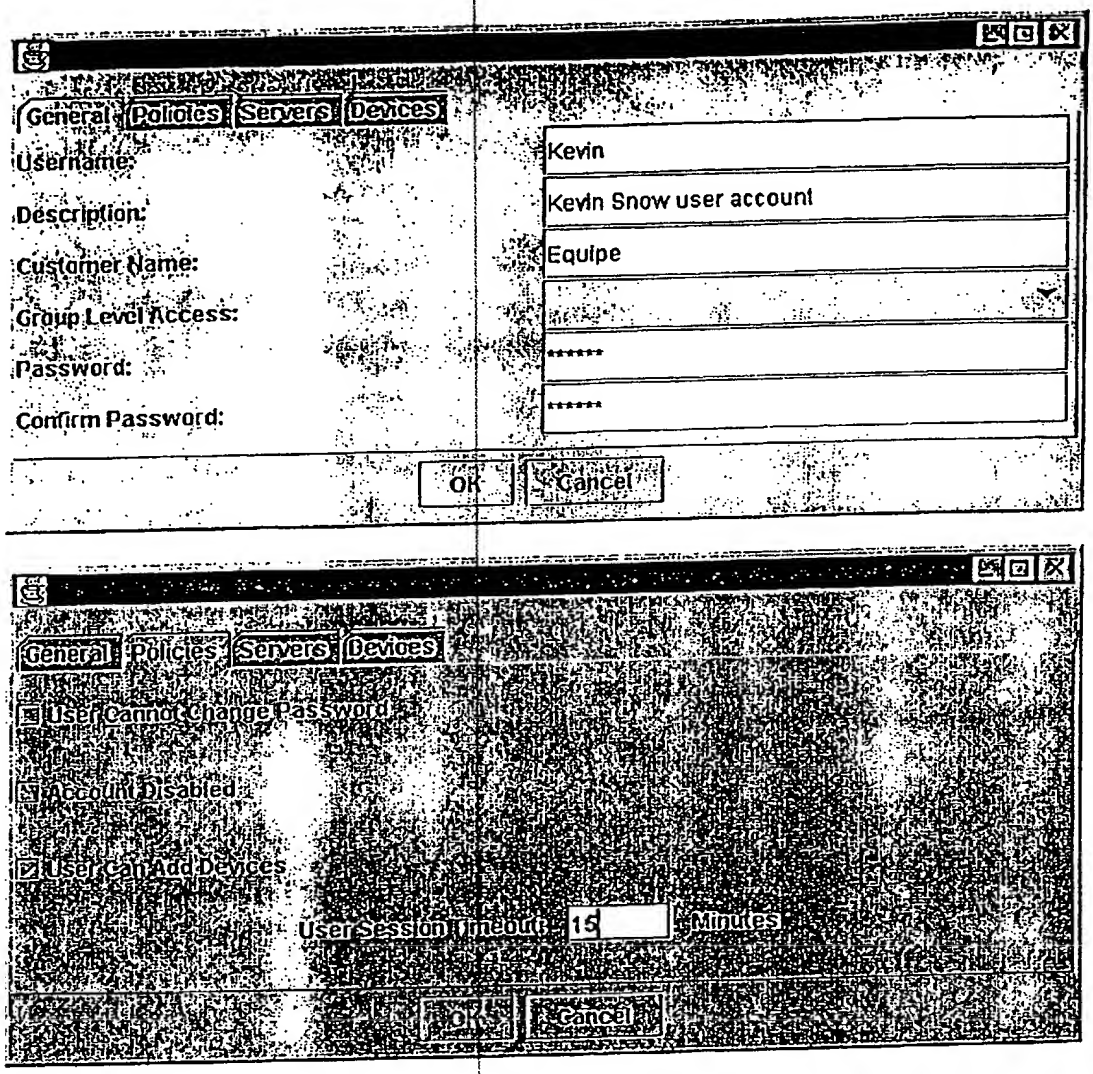
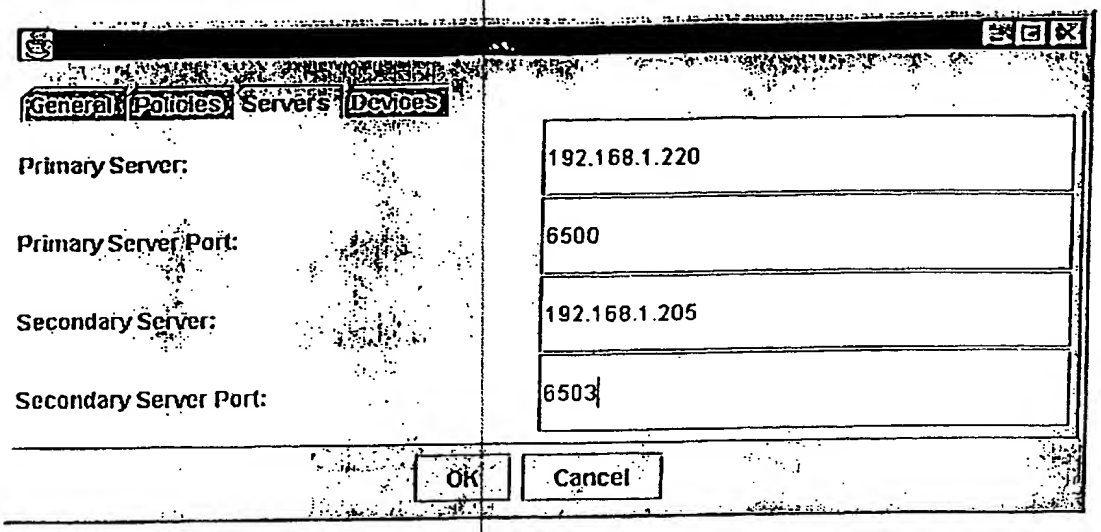


Fig. 11d

Fig. 11e



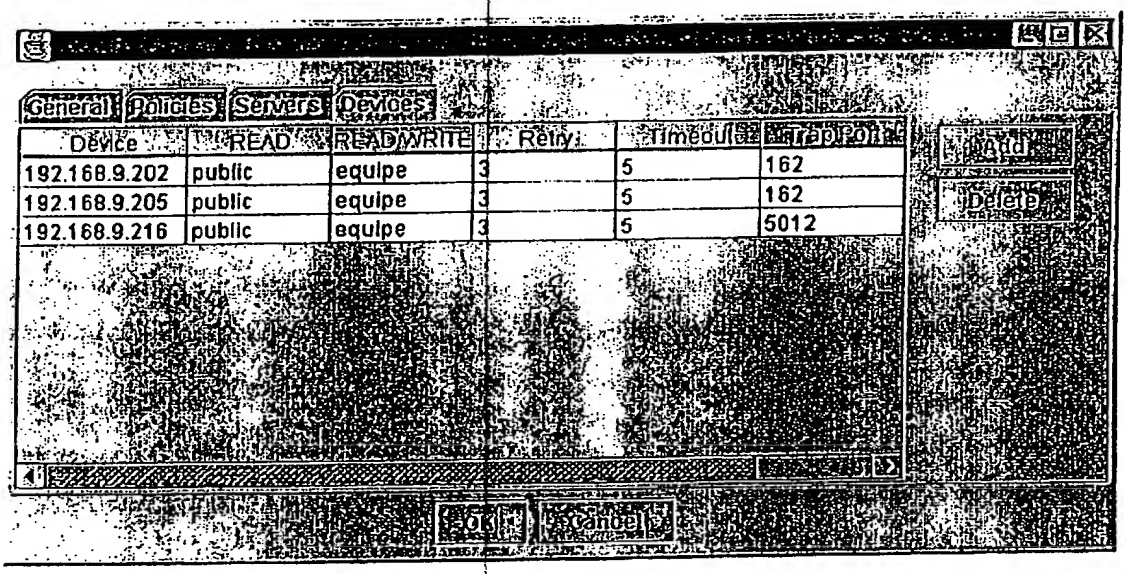


Fig. 11f

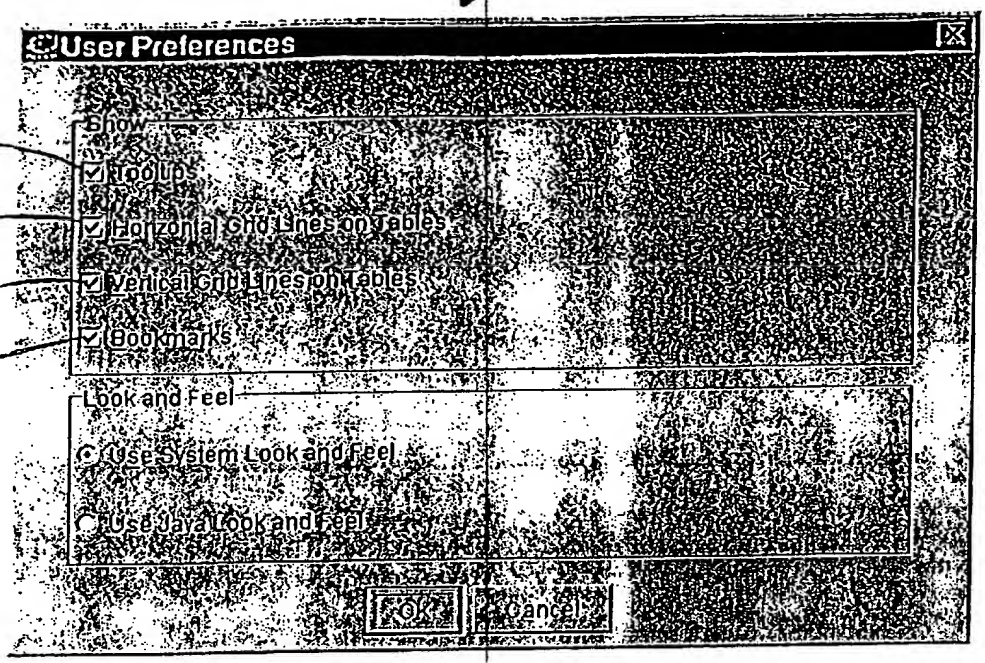
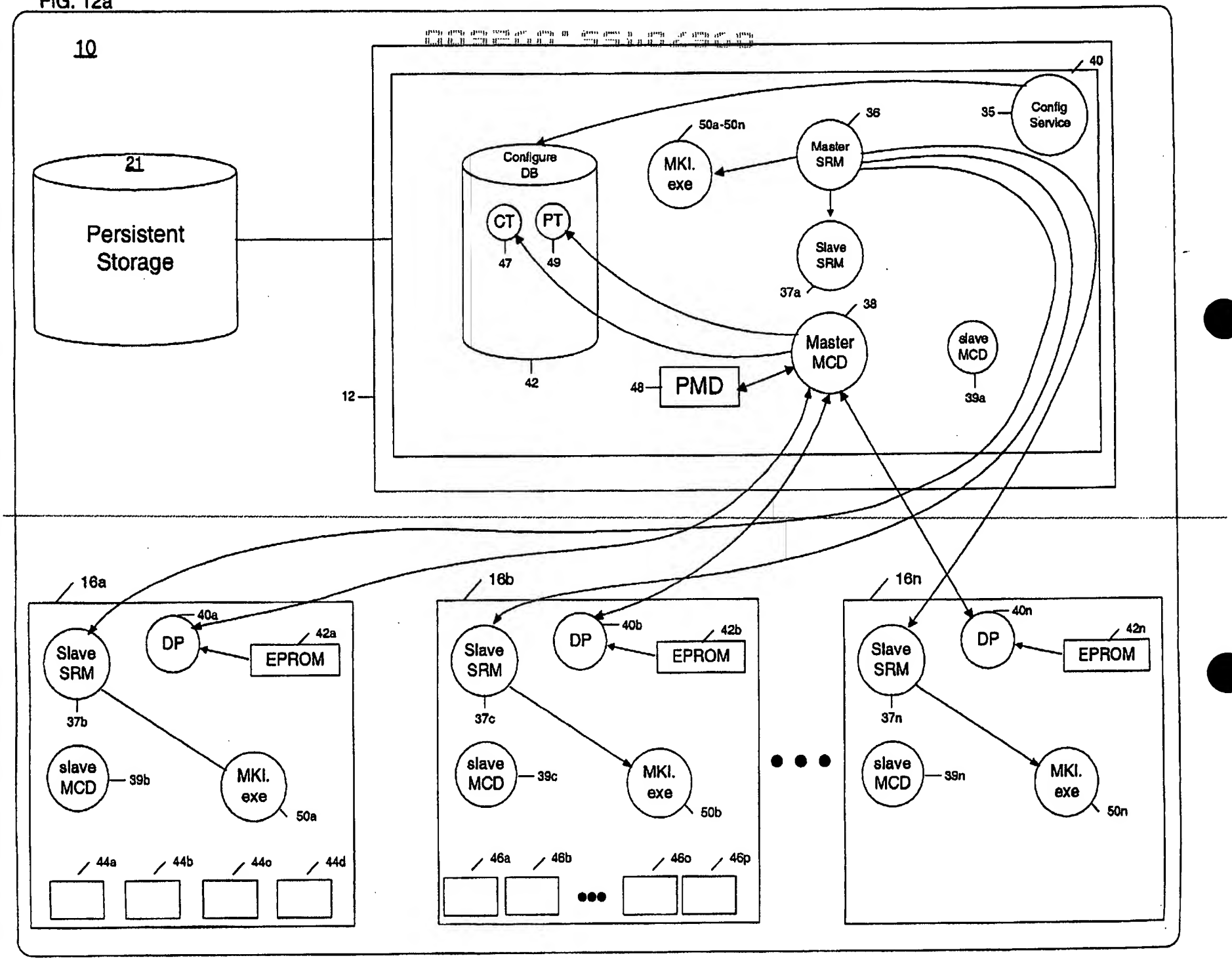

904
User Preferences
Show
910a
ToolTips
910b
Horizontal Grid Lines on Tables
910c
Vertical Grid Lines on Tables
910d
Bookmarks
Look and Feel
Use System Look and Feel
Use Java Look and Feel
OK
Cancel

Fig. 11g

FIG. 12a


10
21
Persistent Storage
40
Config Service
35
36
Master SRM
50a-50n
MKI. exe
Configure DB
CT
PT
47
49
Slave SRM
37a
38
Master MCD
slave MCD
39a
48
PMD
42
12
16a
16b
16n
Slave SRM
37b
DP
40a
EPROM
42a
slave MCD
39b
MKI. exe
50a
44a
44b
44o
44d
Slave SRM
37c
DP
40b
EPROM
42b
slave MCD
39c
MKI. exe
50b
46a
46b
46o
46p
Slave SRM
37n
DP
40n
EPROM
42n
slave MCD
39n
MKI. exe
50n

CARD TABLE

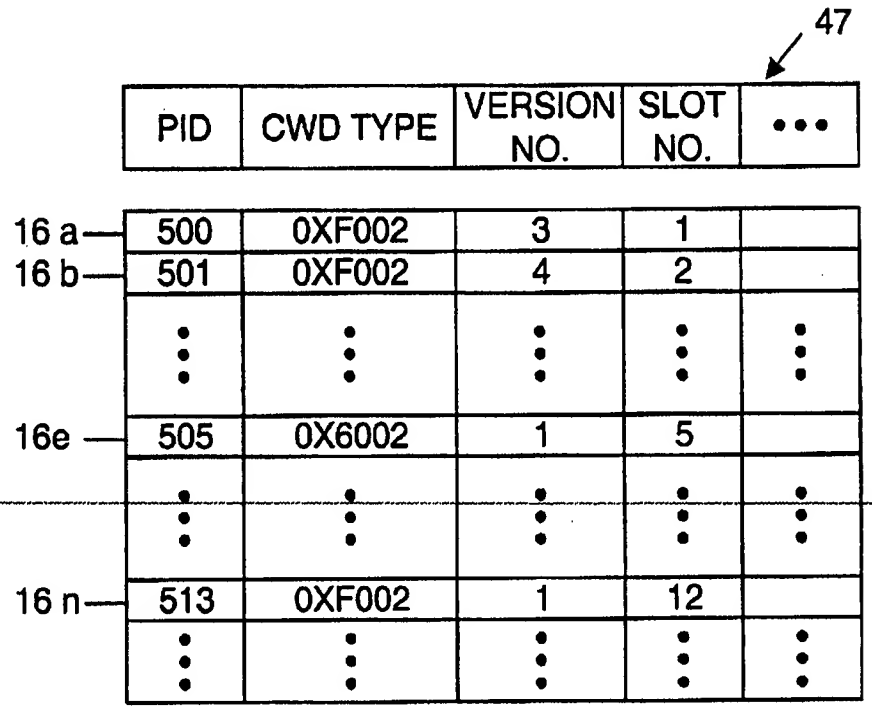


FIG. 12b

PORT TABLE

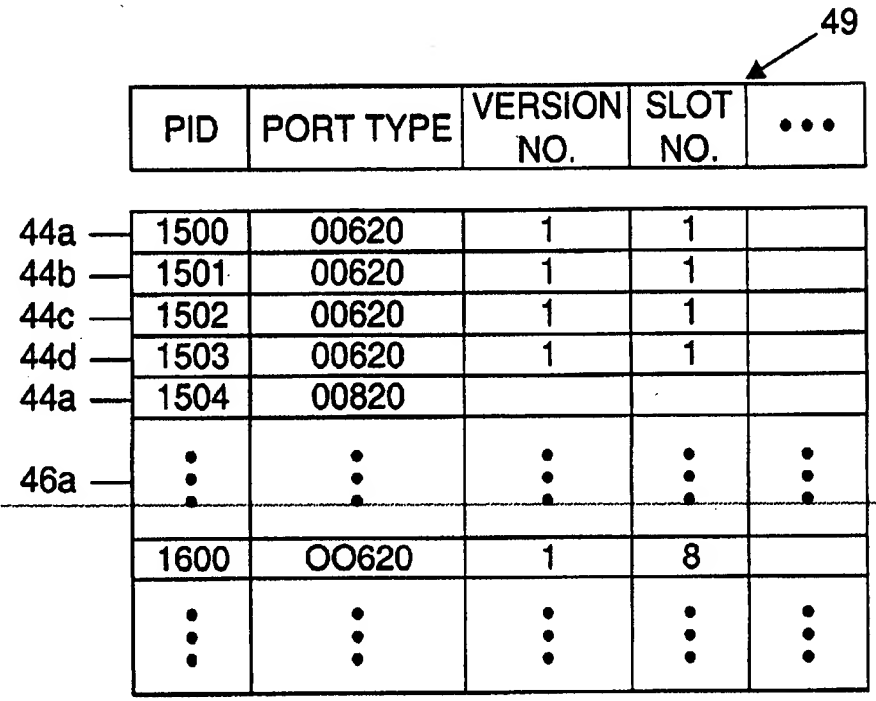


FIG. 12c

FIG. 13a

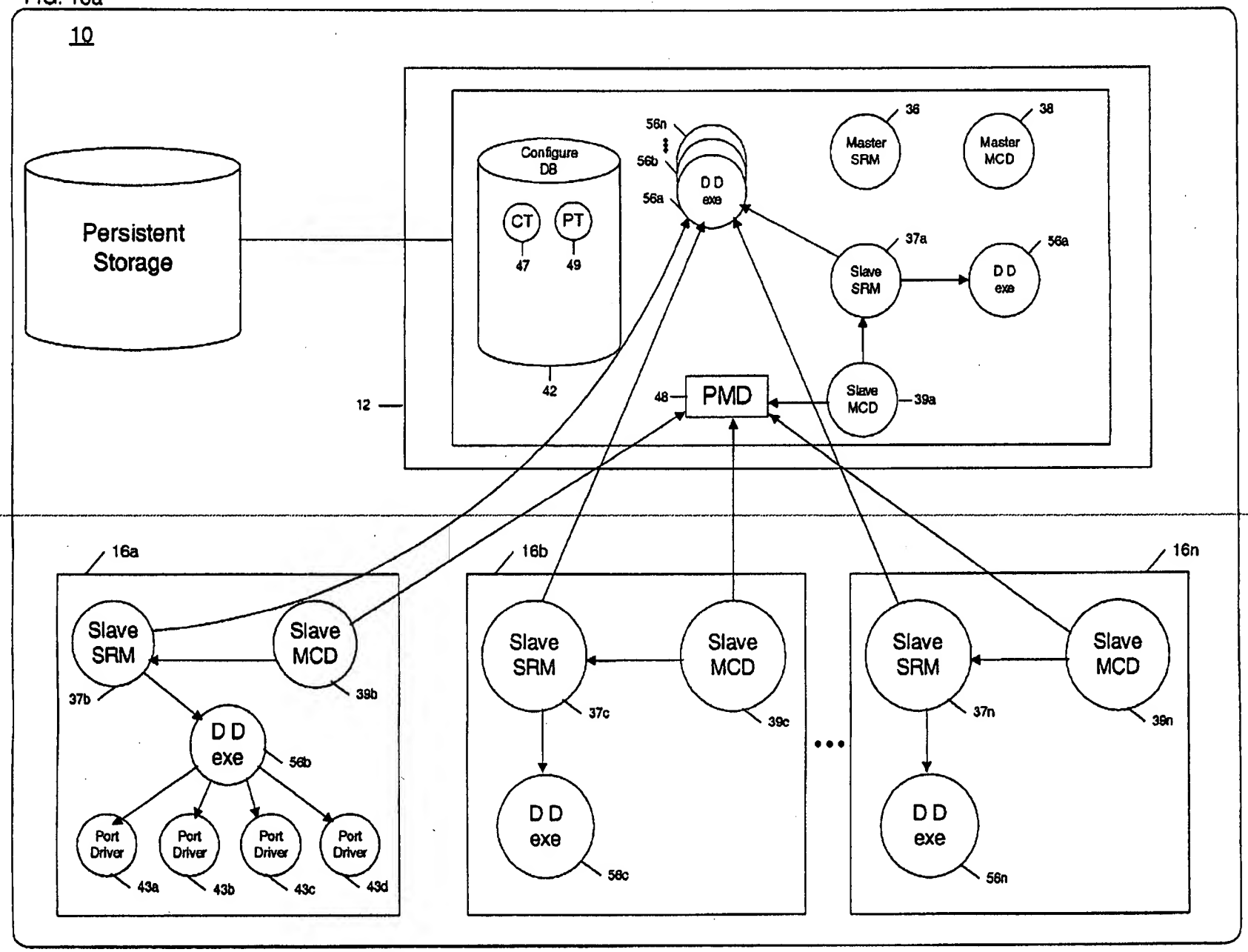
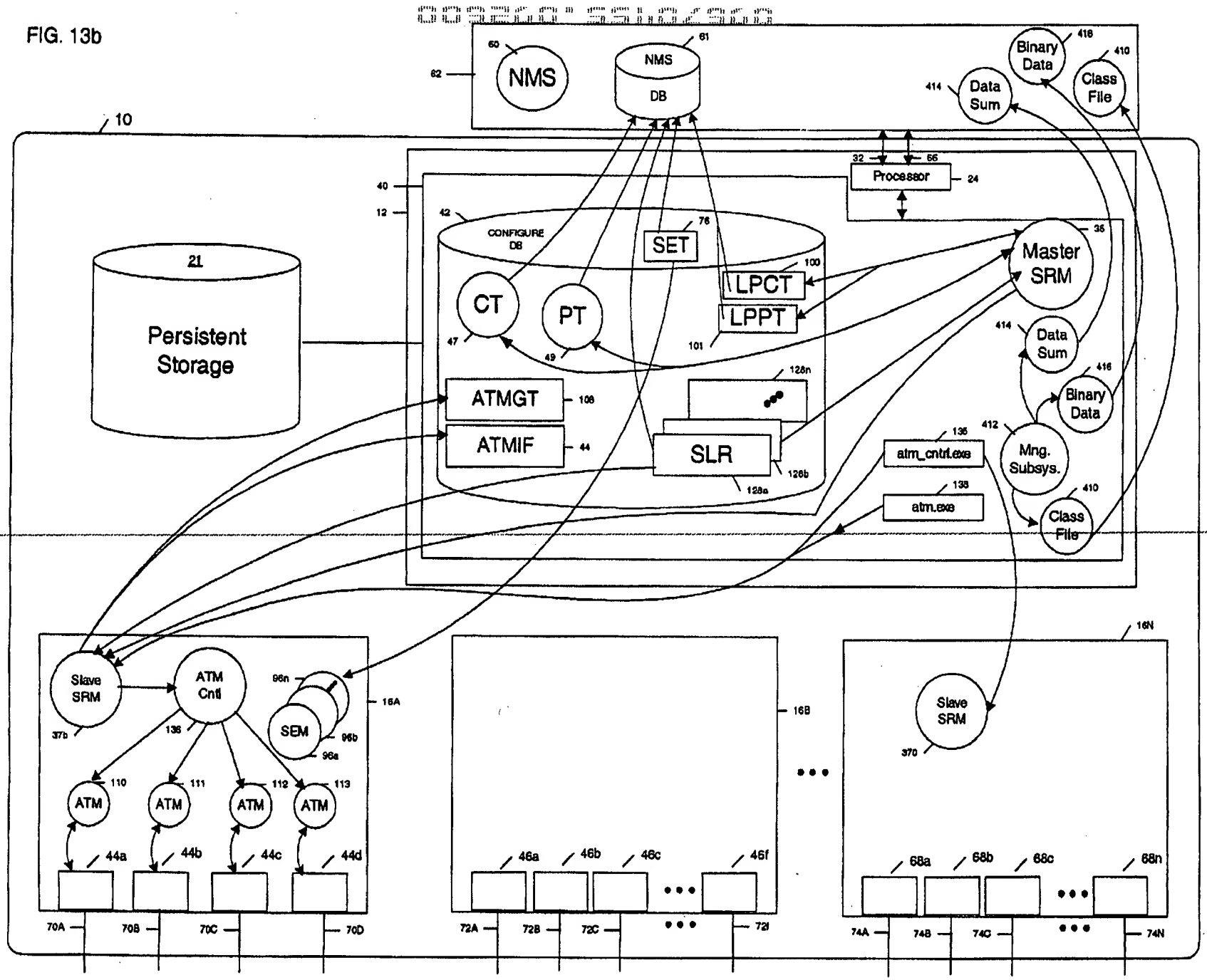


FIG. 13b


10
NMS
60
62
NMS DB
61
Binary Data
416
Class File
410
Data Sum
414
Processor
24
32
56
40
12
42
CONFIGURE DB
SET
76
Master SRM
35
21
Persistent Storage
CT
47
PT
49
LPCT
100
LPPT
101
Data Sum
414
Binary Data
416
ATMGT
106
ATMIF
44
128n
SLR
126b
128a
atm_cntrl.exe
135
atm.exe
133
Mng. Subsys.
412
Class File
410
16N
Slave SRM
37b
ATM Cntl
136
96n
SEM
96b
96a
16A
ATM
110
111
112
113
44a
44b
44c
44d
70A
70B
70C
70D
16B
46a
46b
46c
46f
72A
72B
72C
72I
Slave SRM
370
68a
68b
68c
68n
74A
74B
74C
74N

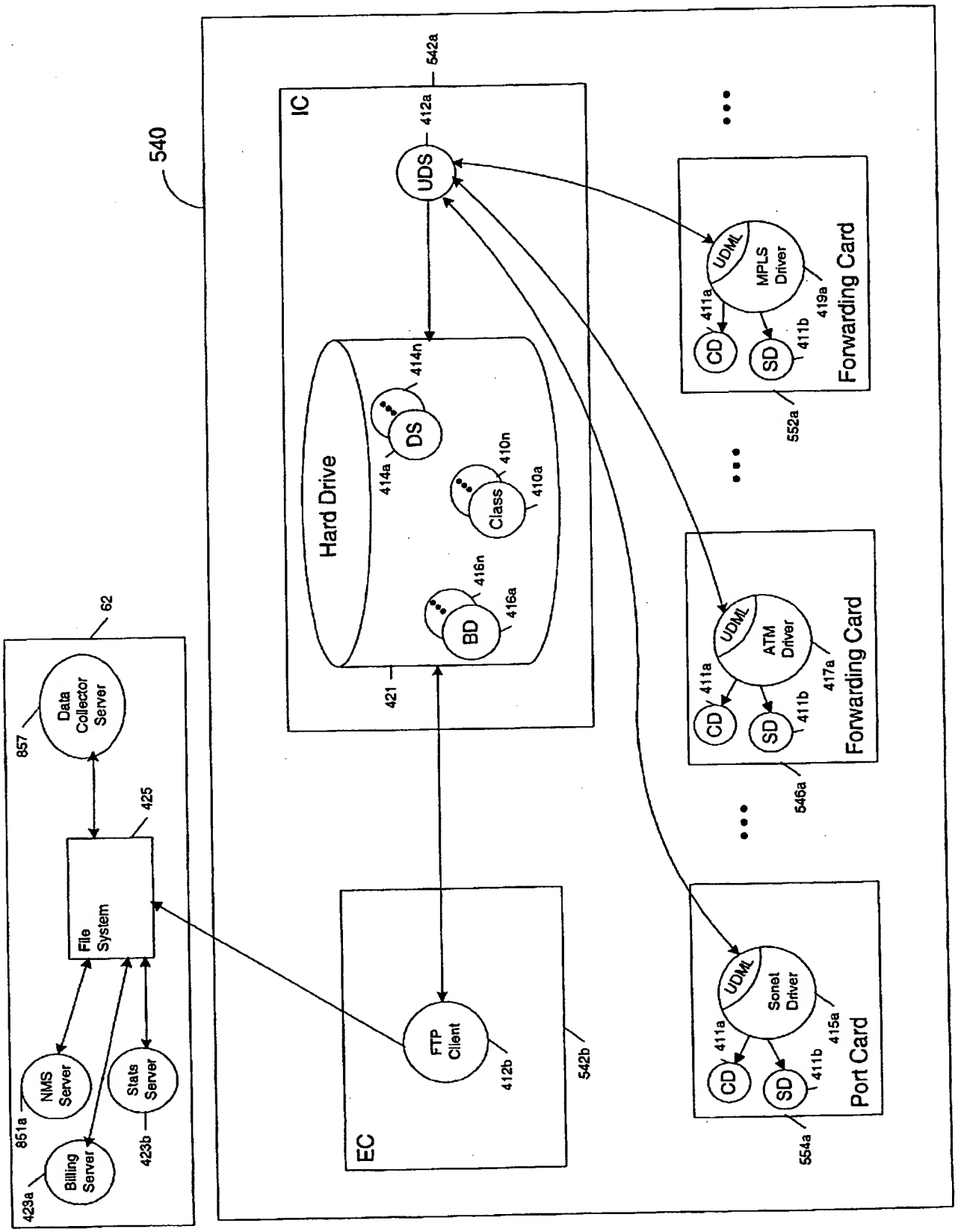

540
IC
542a
412a
UDS
Hard Drive
414n
DS
414a
Class
410n
410a
BD
416n
416a
421
EC
FTP Client
412b
542b
62
Data Collector Server
857
425
File System
NMS Server
851a
Stats Server
423b
Billing Server
423a
Forwarding Card
UDML
MPLS Driver
411a
419a
CD
SD
411b
552a
ATM Driver
417a
546a
Sonet Driver
415a
Port Card
554a

Fig. 13c

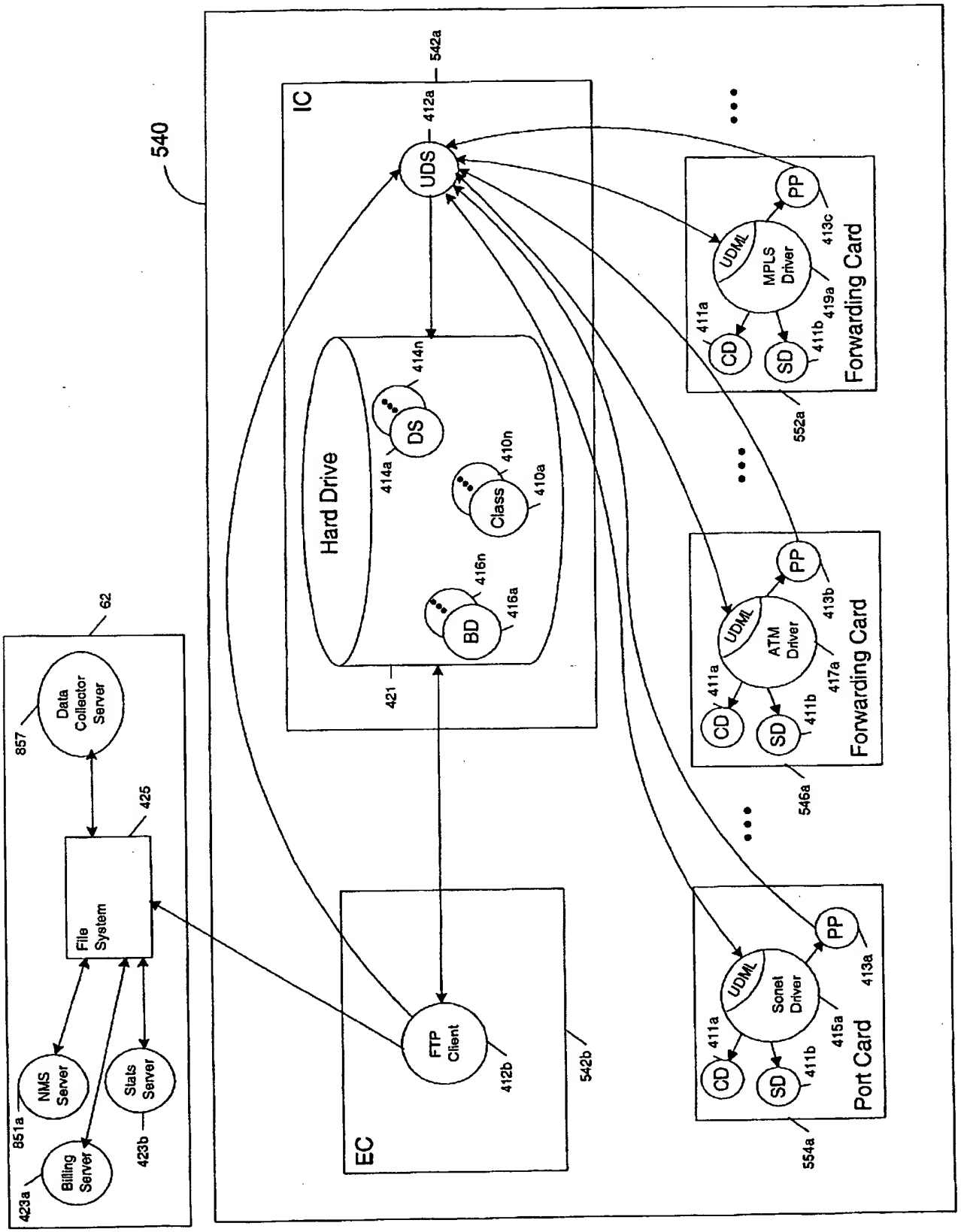

540
IC
542a
412a
UDS
Hard Drive
414n
DS
414a
Class
410n
410a
BD
416n
416a
421
EC
FTP Client
412b
542b
62
Data Collector Server
857
File System
425
NMS Server
851a
Stats Server
423b
Billing Server
423a
Forwarding Card
552a
546a
Port Card
554a
UDML
MPLS Driver
ATM Driver
Sonet Driver
PP
CD
SD
411a
411b
413c
419a
413b
417a
413a
415a

Fig. 13d

FIG. 14a

Service Endpoint Table 76

	Service Endpoint #	Port PID
78	1	1500
80	2	1501
82	3	1501
84	4	1501
86	5	1502
88	6	1502
90	7	1503
92	8	1503
94	9	1503
168	10	1502
	⋮	⋮

FIG. 14b

Logical to Physical Card Table 100

	LID (98)	Primary PID (102)	Back-up PID (104)
106	30	500	513
109	31	501	513
	⋮	⋮	⋮

FIG. 14c

Logical to Physical Port Table 101

	LID (98)	Primary PID (102)	Back-up PID (104)
107	40	1500	1600
	⋮	⋮	⋮

FIG. 14d

ATM Group Table 108

Group #	Card LID	•••
1	30	
2	30	
3	30	
4	30	

FIG. 14e

ATM Interface Table 114

ATM IF	ATM Group	SE	•••
1	1	1	
2	1	1	
3	1	1	
4	2	2	
5	2	3	
6	2	4	
⋮	⋮	⋮	⋮
12	3	10	
⋮	⋮	⋮	⋮

170

FIG. 14f

Software Load Record 128a

Control Shim	LID
atm-cntl.exe	30

130 134 132

FIG. 15

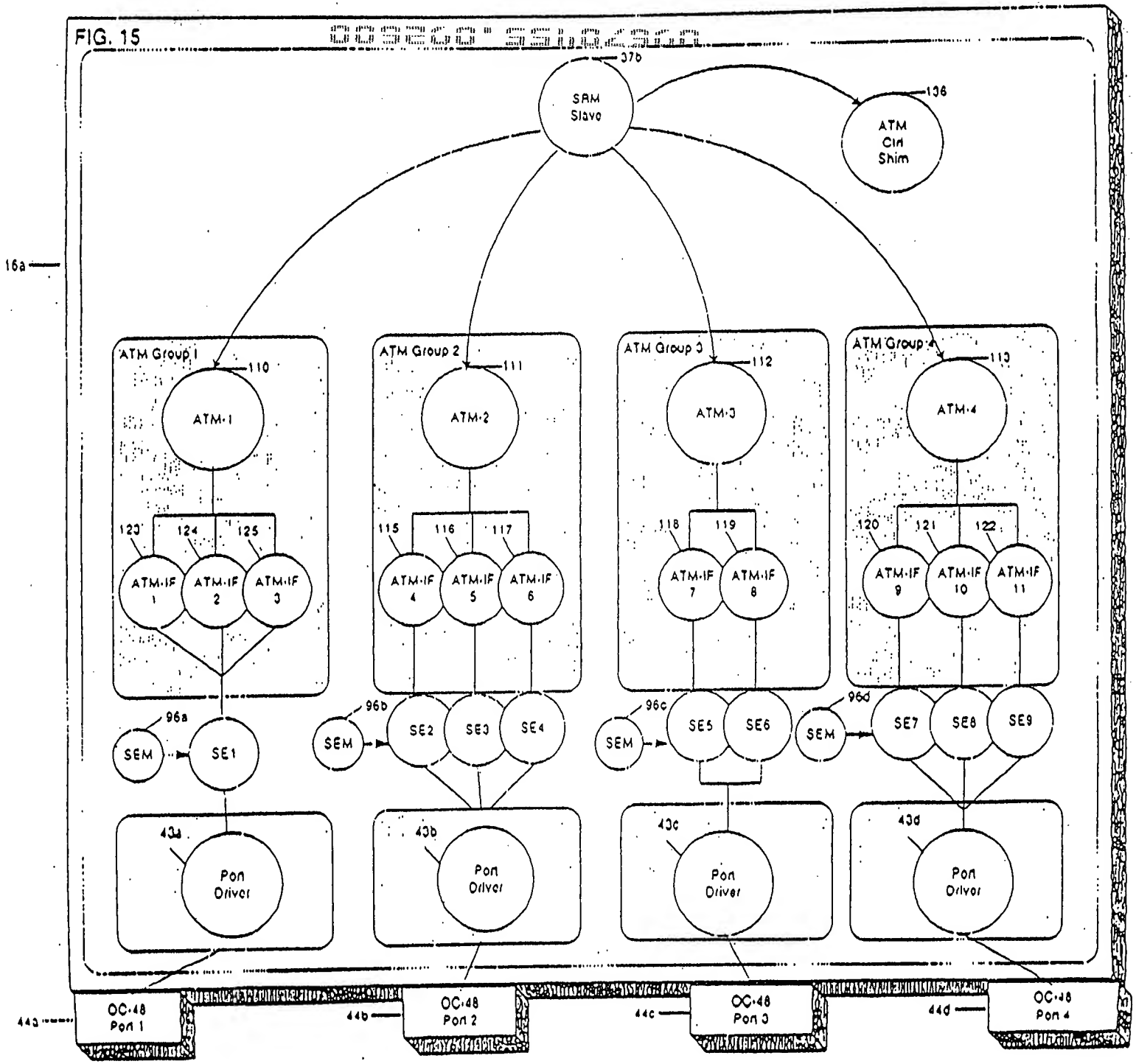

37b
SAM Slave
136
ATM Cln Shim
16a
ATM Group 1
110
ATM-1
123
124
125
ATM-IF 1
ATM-IF 2
ATM-IF 3
96a
SEM
SE1
43a
Pon Driver
ATM Group 2
111
ATM-2
115
116
117
ATM-IF 4
ATM-IF 5
ATM-IF 6
96b
SEM
SE2
SE3
SE4
43b
Pon Driver
ATM Group 3
112
ATM-3
118
119
ATM-IF 7
ATM-IF 8
96c
SEM
SE5
SE6
43c
Pon Driver
ATM Group 4
113
ATM-4
120
121
122
ATM-IF 9
ATM-IF 10
ATM-IF 11
96d
SEM
SE7
SE8
SE9
43d
Pon Driver
44a
OC-48 Pon 1
44b
OC-48 Pon 2
44c
OC-48 Pon 3
44d
OC-48 Pon 4

FIG. 16a

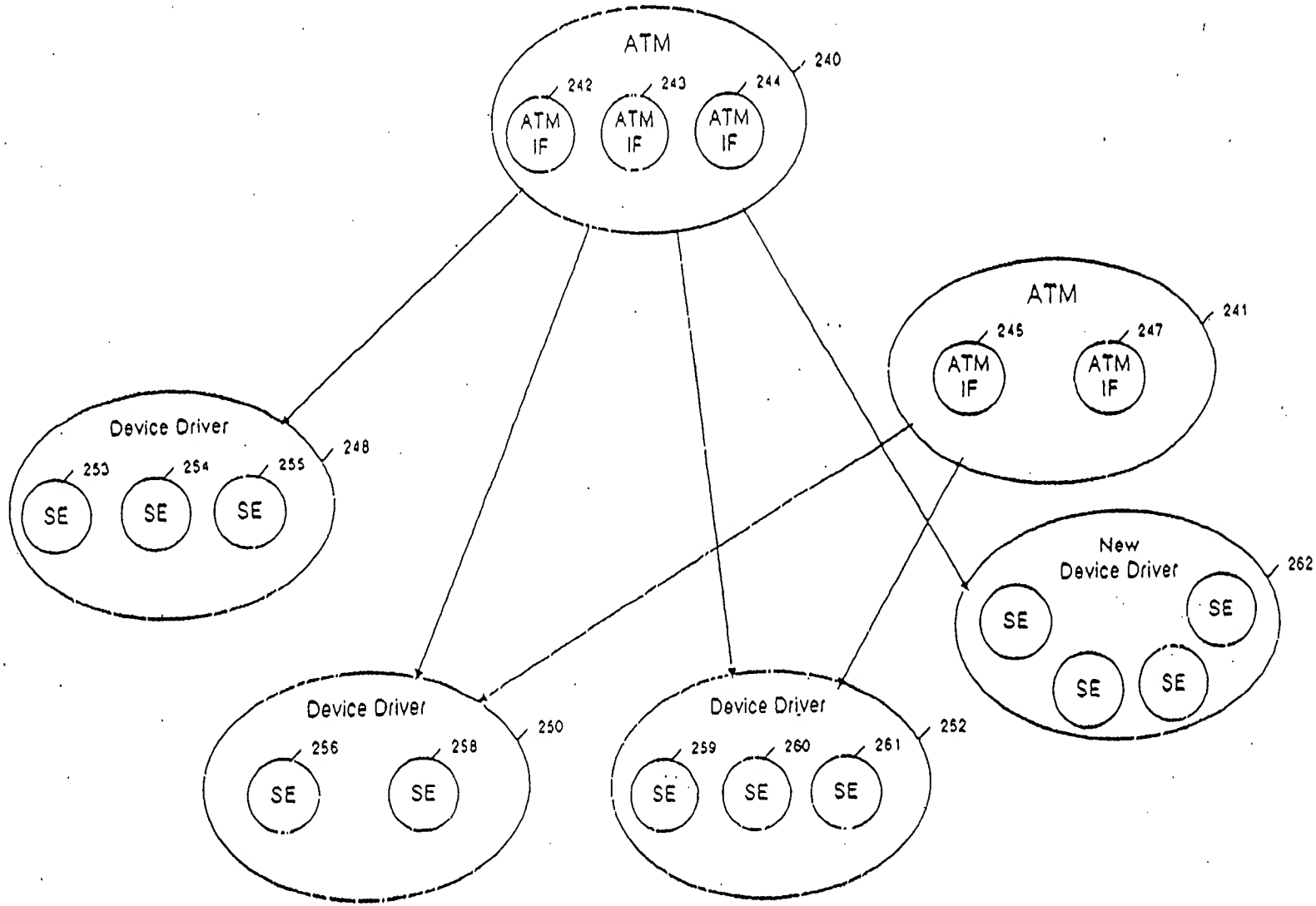

ATM
240
242
243
244
ATM IF
ATM IF
ATM IF
ATM
241
245
247
ATM IF
ATM IF
Device Driver
248
253
254
255
SE
SE
SE
New Device Driver
262
SE
SE
SE
SE
Device Driver
250
256
258
SE
SE
Device Driver
252
259
260
261
SE
SE
SE

FIG. 16b

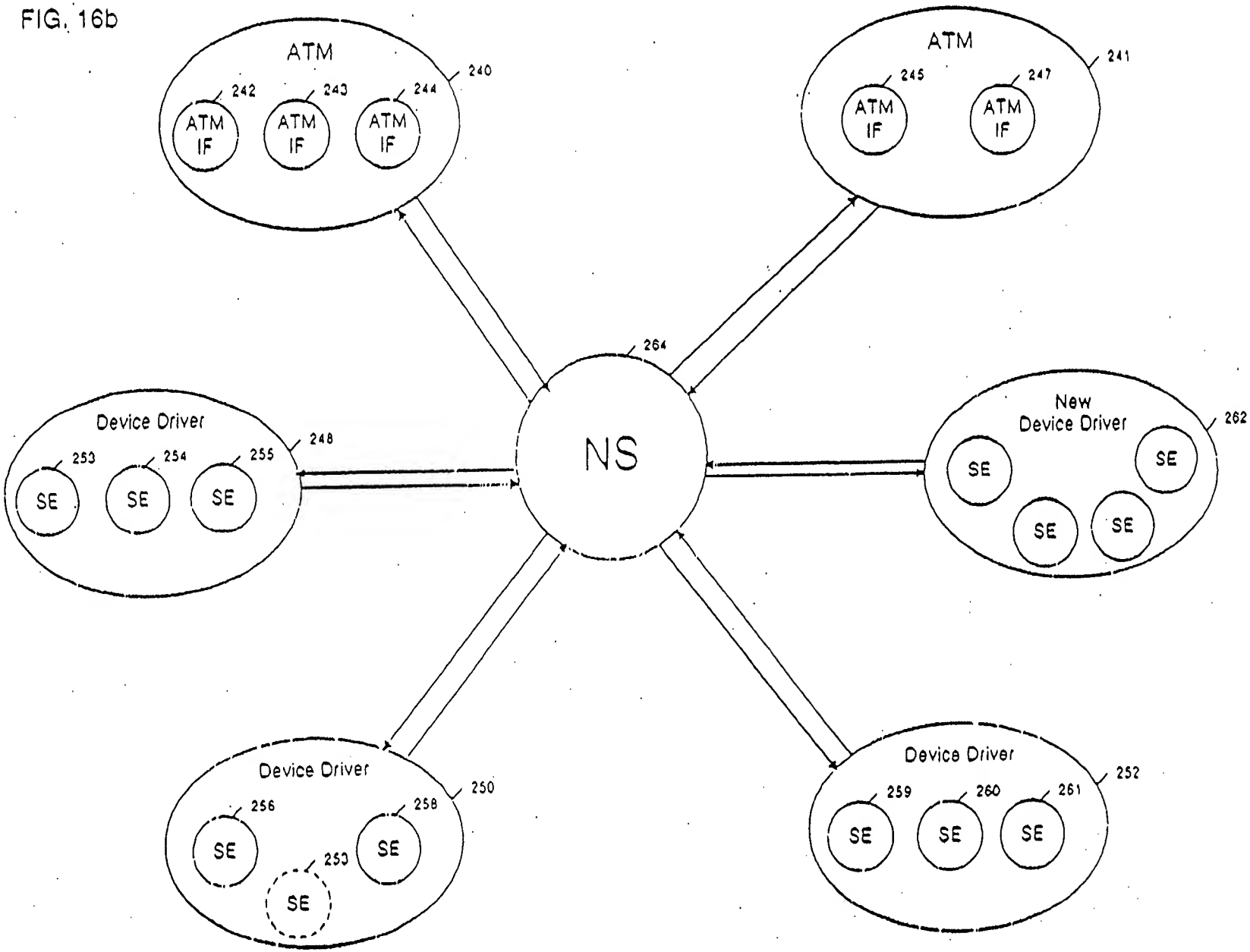

ATM
240
242
243
244
ATM IF
ATM IF
ATM IF
ATM
241
245
247
ATM IF
ATM IF
264
NS
Device Driver
248
253
254
255
SE
SE
SE
New Device Driver
262
SE
SE
SE
SE
Device Driver
250
256
258
253
SE
SE
SE
Device Driver
252
259
260
261
SE
SE
SE

FIG. 16c

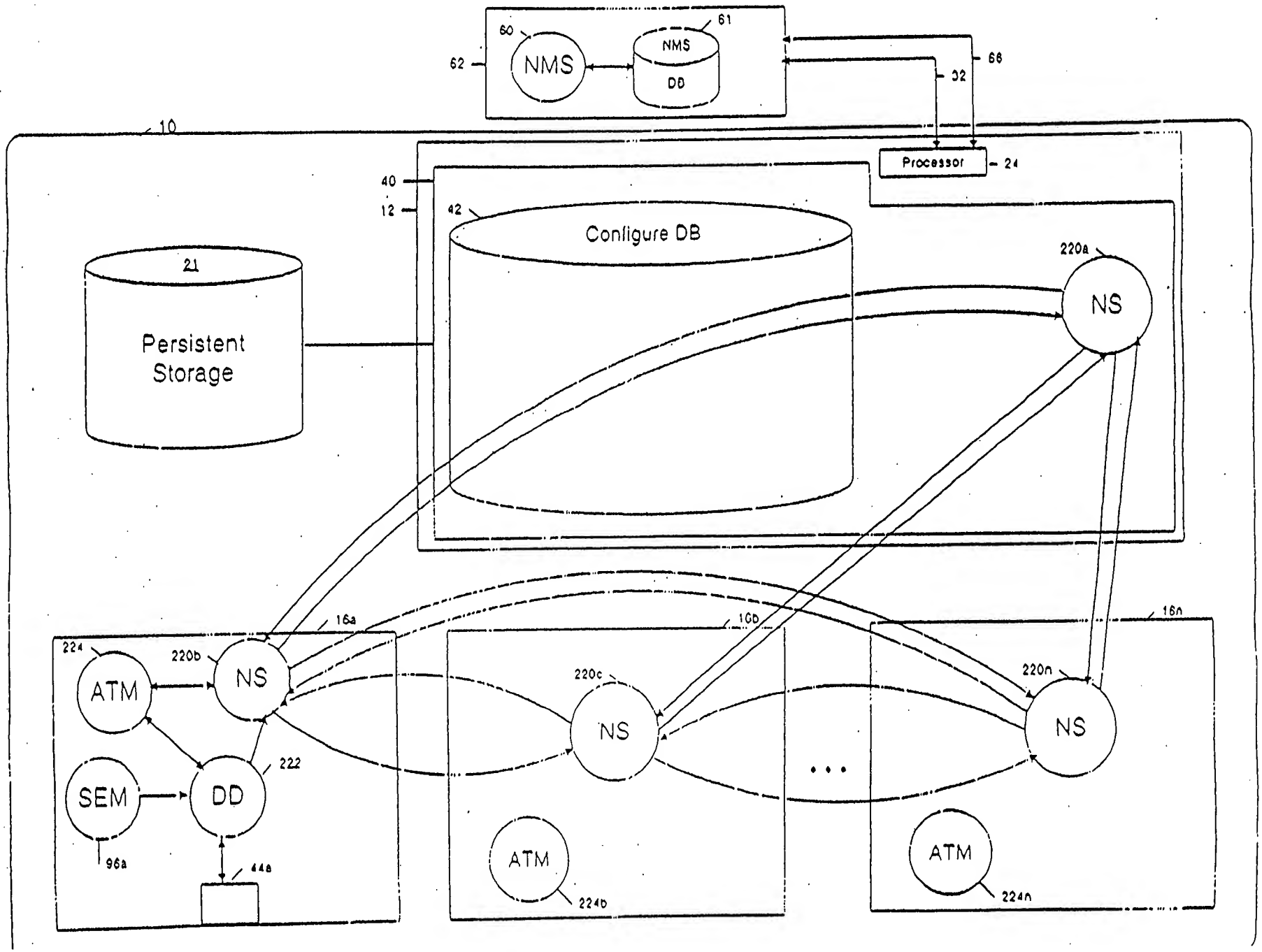

60
NMS
61
NMS
DD
62
68
32
10
Processor
24
40
12
42
Configure DB
21
Persistent Storage
220a
NS
16a
224
ATM
220b
NS
222
SEM
DD
96a
44a
16b
220c
NS
ATM
224b
16n
220n
NS
ATM
224n

FIG. 16d

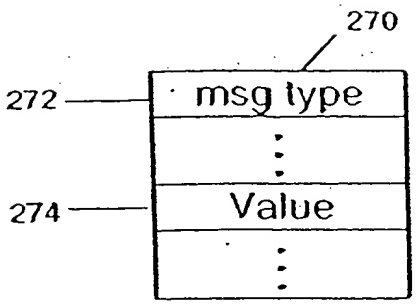


FIG. 17

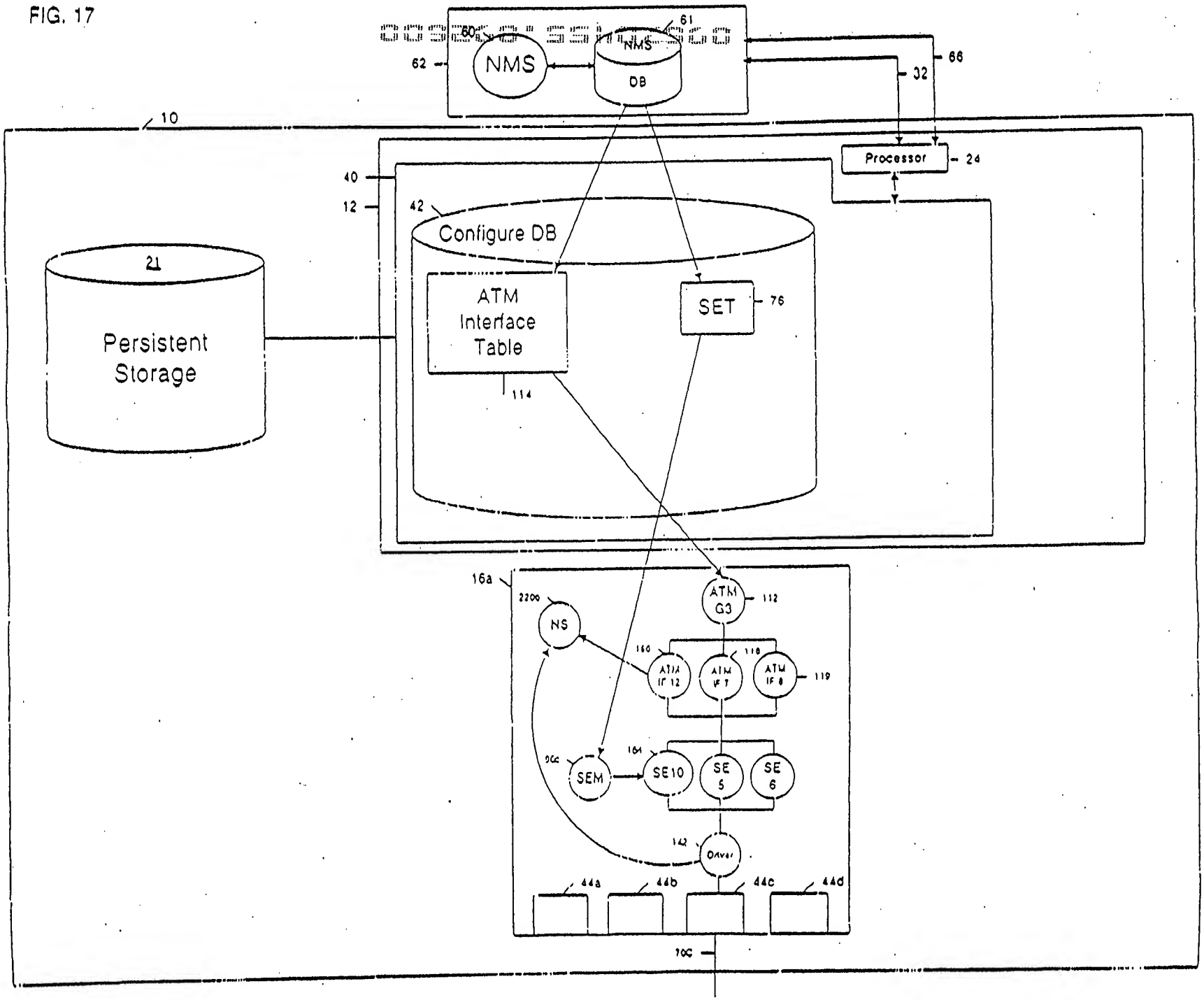

60
61
NMS
NMS
DB
62
66
32
10
Processor
24
40
12
42
Configure DB
21
Persistent Storage
ATM Interface Table
114
SET
76
16a
ATM G3
112
NS
160
118
119
SEM
SE10
SE 5
SE 6
142
Driver
44a
44b
44c
44d
70c

FIG. 18

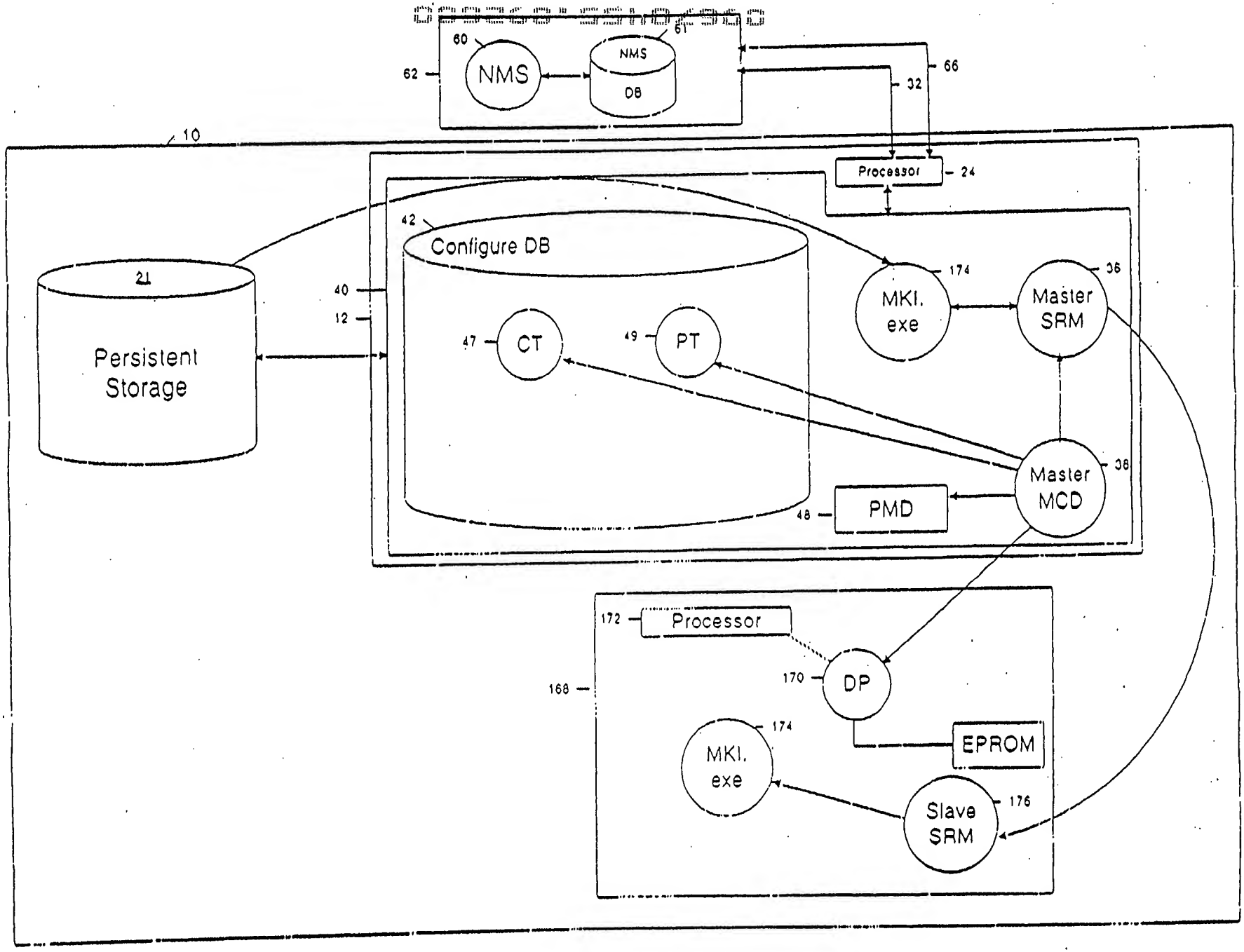

60
NMS
61
NMS
DB
62
66
32
10
Processor
24
42
Configure DB
21
Persistent Storage
40
12
47
CT
49
PT
MKI. exe
174
Master SRM
36
Master MCD
38
PMD
48
172
Processor
170
DP
168
EPROM
MKI. exe
174
Slave SRM
176

FIG. 19

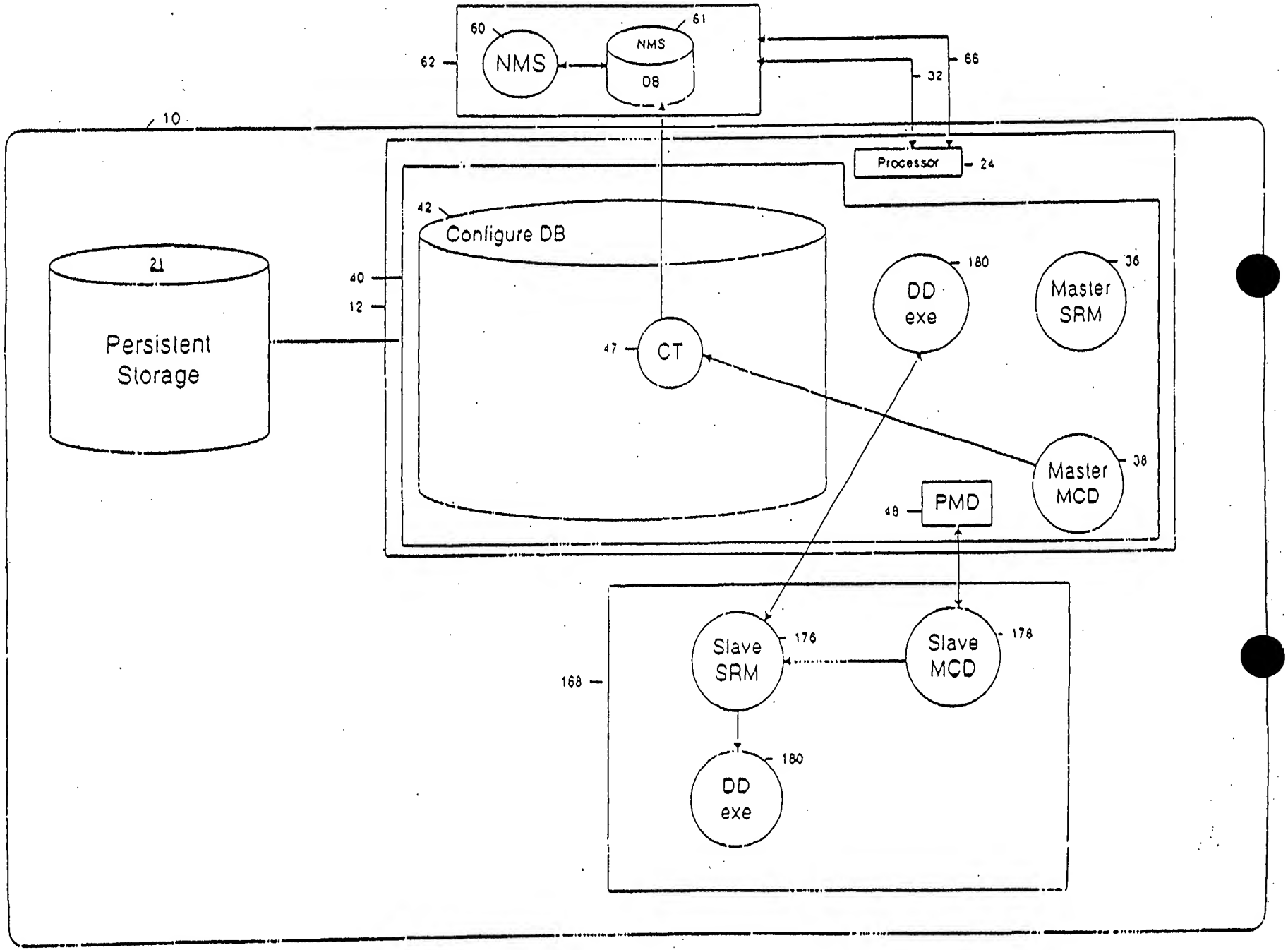

60
NMS
61
NMS
DB
62
66
32
10
Processor
24
42
Configure DB
21
Persistent Storage
40
12
47
CT
180
DD exe
36
Master SRM
38
Master MCD
48
PMD
168
Slave SRM
176
Slave MCD
178
180
DD exe

FIG. 20

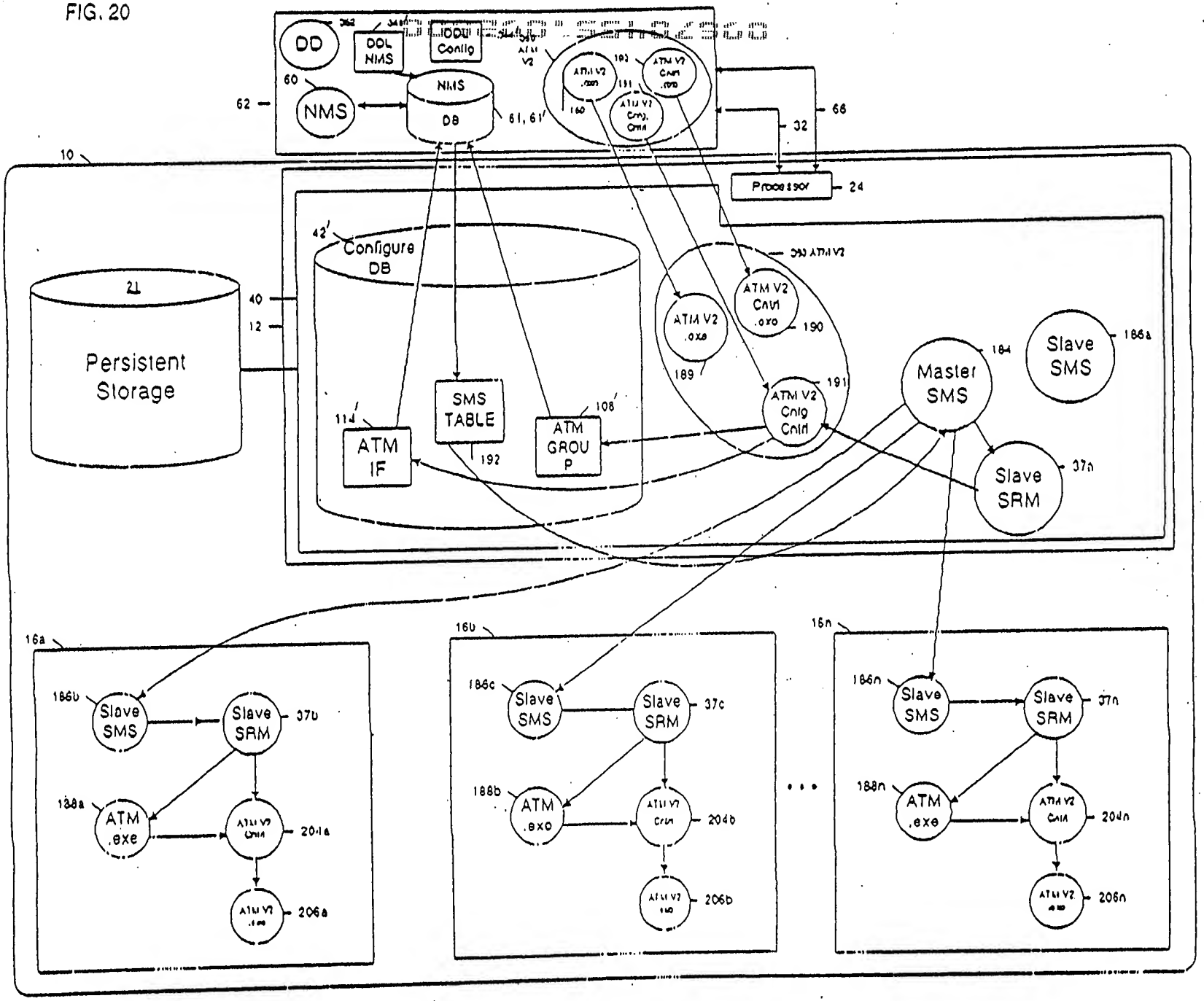

DD
DDL NMS
IODU Config
NMS
NMS DB
60
62
61, 61'
66
32
10
Processor
24
42'
Configure DB
21
Persistent Storage
40
12
ATM V2 .exe
ATM V2 Cnfg .exe
190
189
191
ATM V2 Cnfg Cntl
SMS TABLE
192
ATM IF
ATM GROUP
108'
Master SMS
184
Slave SMS
186a
Slave SRM
37n
16a
186b
Slave SMS
Slave SRM
37b
188a
ATM .exe
ATM V2 Cnfg
204a
206a
16b
186c
Slave SMS
Slave SRM
37c
188b
ATM .exe
ATM V2 Cnfg
204b
206b
16n
186n
Slave SMS
Slave SRM
37n
188n
ATM .exe
ATM V2 Cnfg
204n
206n

FIG. 21

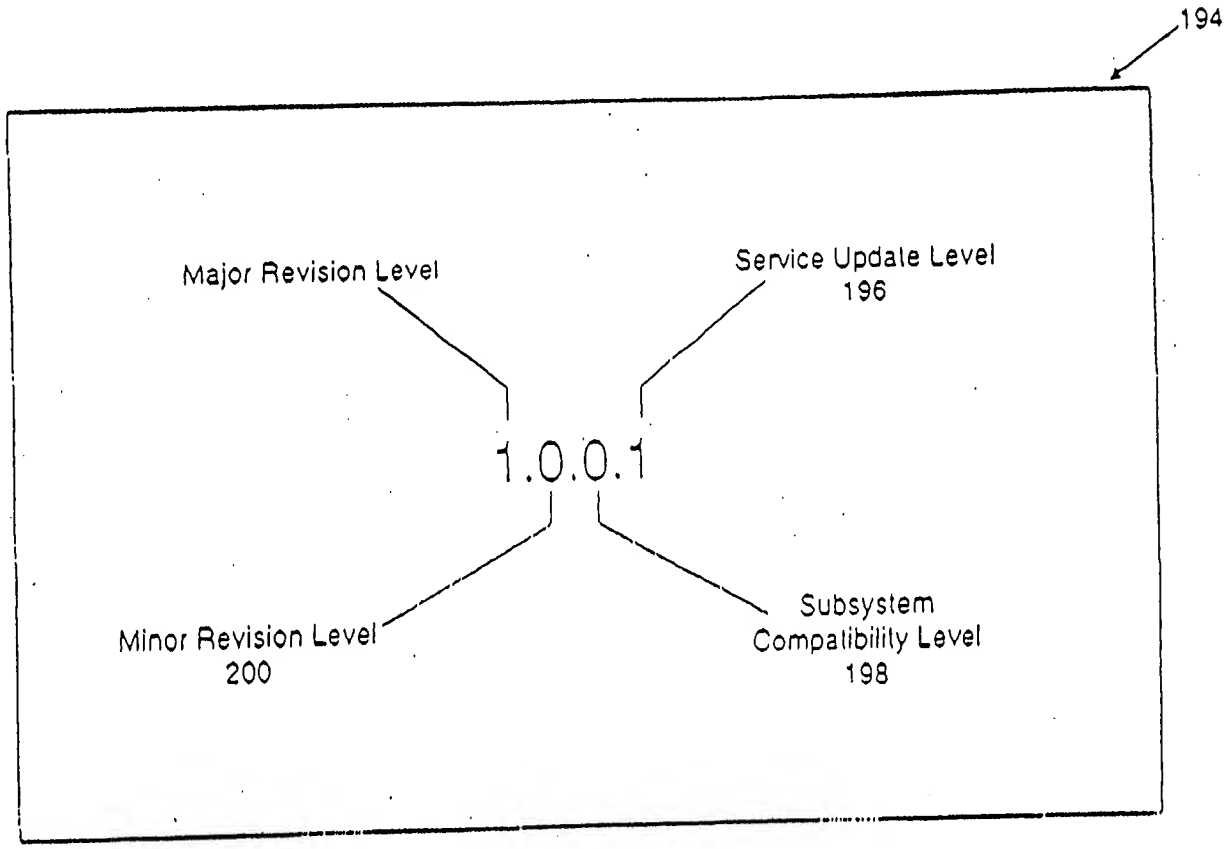

194
Major Revision Level
Service Update Level
196
1.0.0.1
Minor Revision Level
200
Subsystem
Compatibility Level
198

FIG. 22

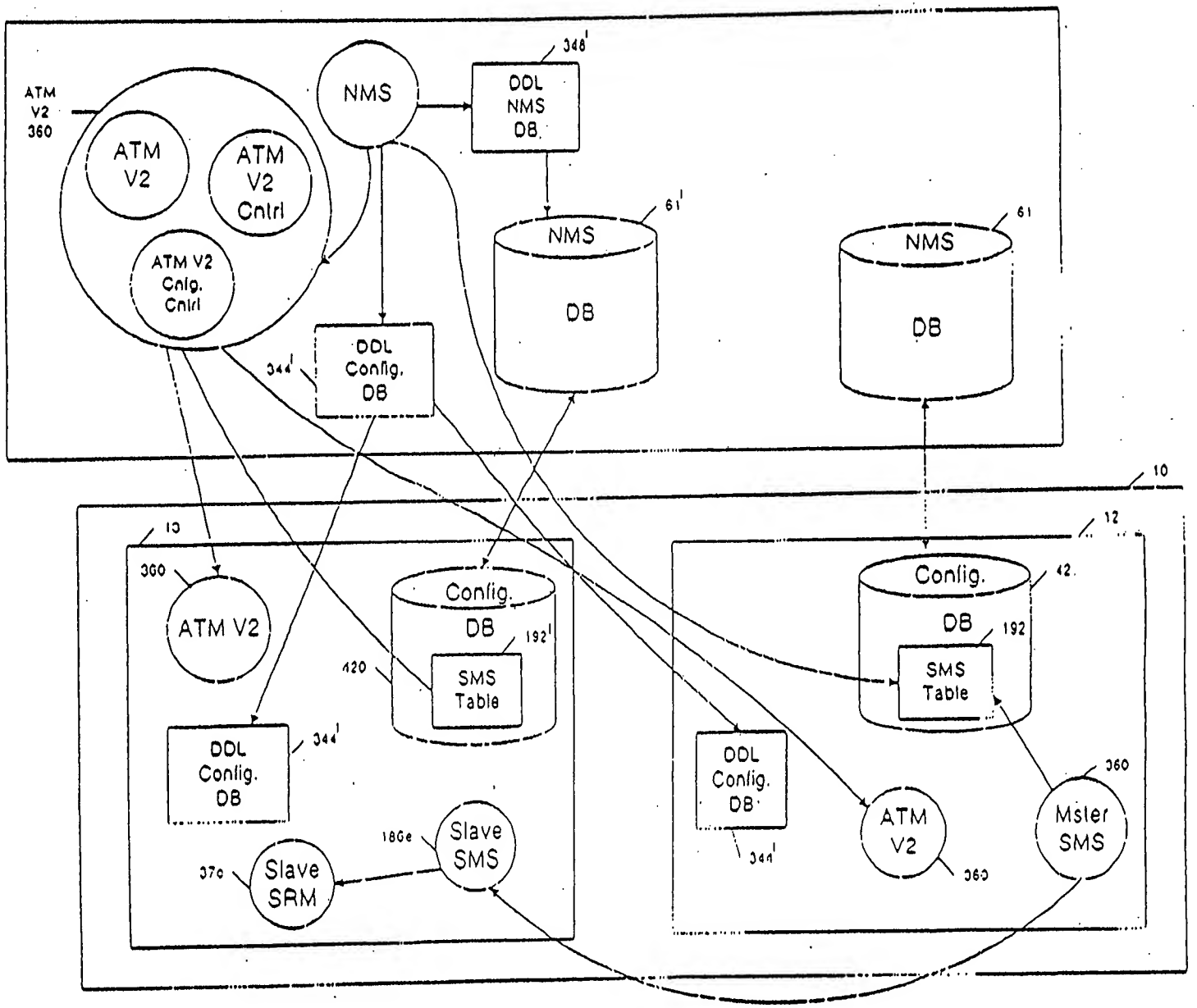

ATM V2 360
ATM V2
ATM V2 Cntrl
ATM V2 Cnfg. Cntrl
NMS
DDL NMS DB
348'
NMS
DB
61'
NMS
DB
61
DDL Config. DB
344'
10
13
360
ATM V2
Config.
DB
192'
420
SMS Table
DDL Config. DB
344'
Slave SMS
180e
Slave SRM
370
12
Config.
DB
192
42
SMS Table
DDL Config. DB
344'
ATM V2
360
Mster SMS
360

FIG. 23

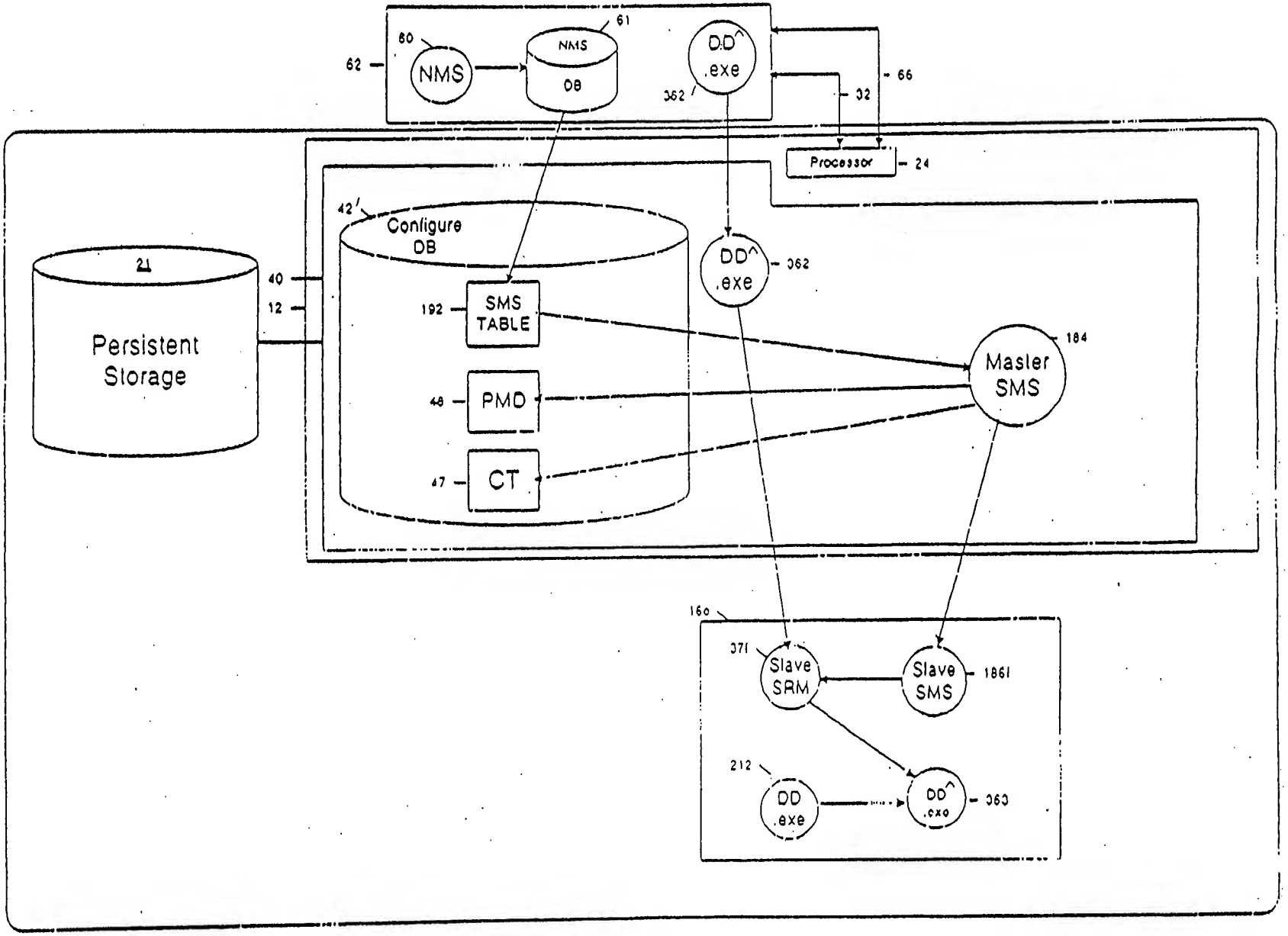

60
NMS
61
NMS
DB
62
DD^
.exe
362
66
32
Processor
24
42
Configure
DB
21
Persistent
Storage
40
12
192
SMS
TABLE
DD^
.exe
362
48
PMD
47
CT
Master
SMS
184
160
371
Slave
SRM
Slave
SMS
1861
212
DD
.exe
DD^
.exe
360

FIG. 24

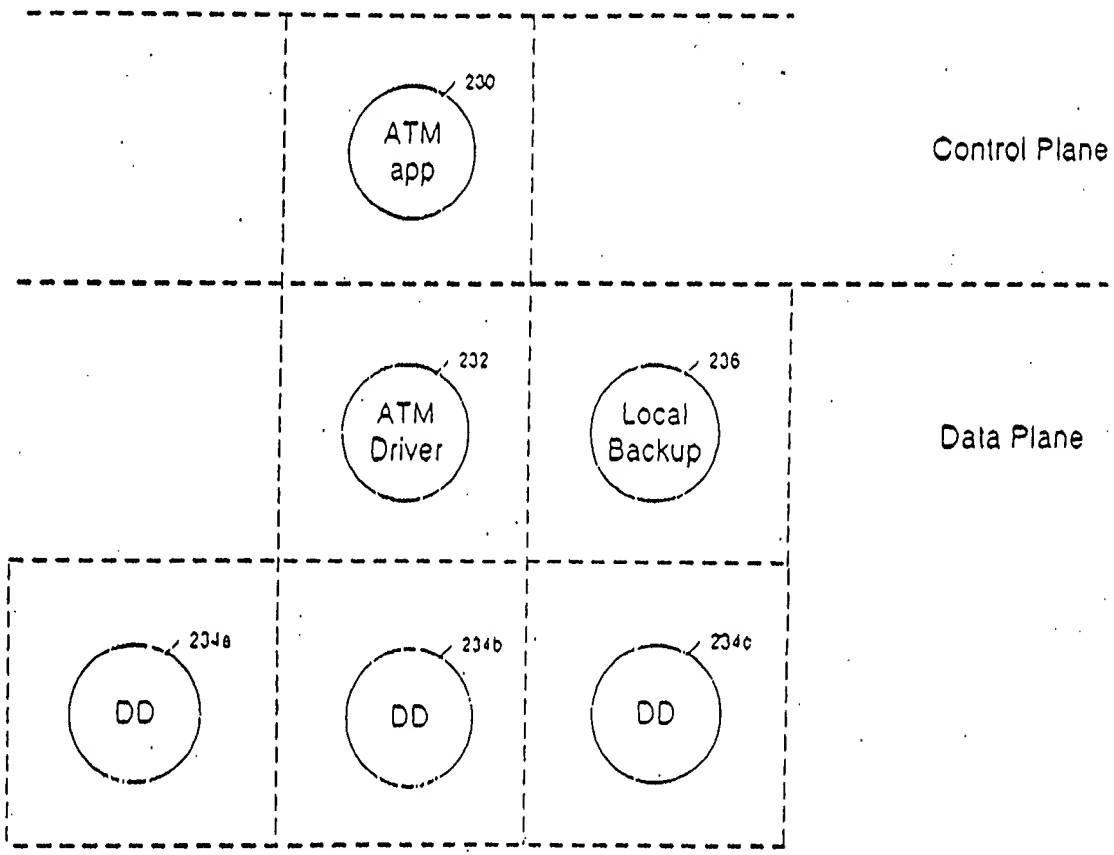

230
ATM app
Control Plane
232
ATM Driver
236
Local Backup
Data Plane
234a
DD
234b
DD
234c
DD

FIG. 25

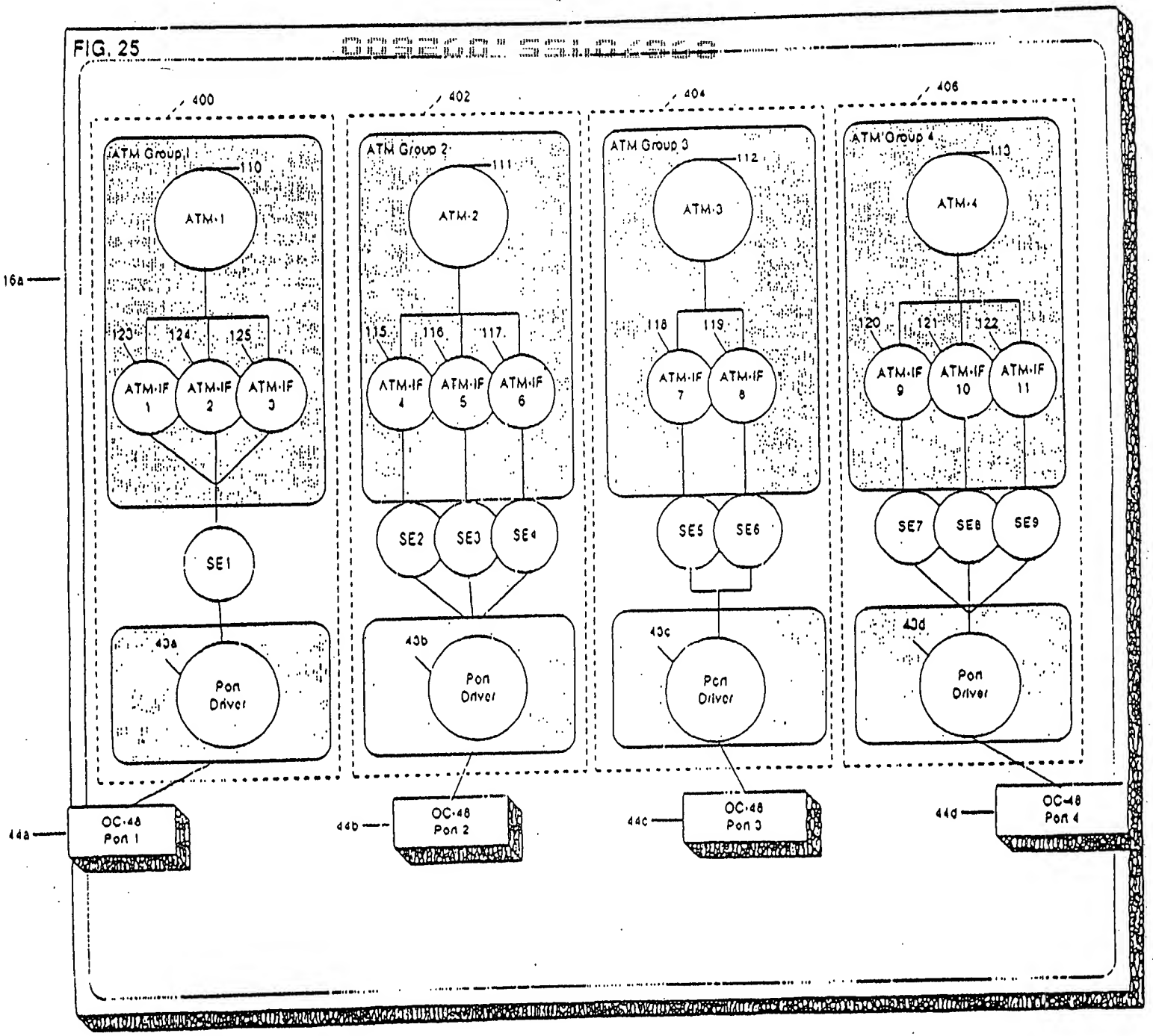

400
402
404
406
ATM Group 1
ATM Group 2
ATM Group 3
ATM Group 4
ATM-1
ATM-2
ATM-3
ATM-4
110
111
112
113
123
124
125
115
116
117
118
119
120
121
122
ATM-IF 1
ATM-IF 2
ATM-IF 3
ATM-IF 4
ATM-IF 5
ATM-IF 6
ATM-IF 7
ATM-IF 8
ATM-IF 9
ATM-IF 10
ATM-IF 11
SE1
SE2
SE3
SE4
SE5
SE6
SE7
SE8
SE9
43a
43b
43c
43d
Pon Driver
16a
44a
44b
44c
44d
OC-48 Pon 1
OC-48 Pon 2
OC-48 Pon 3
OC-48 Pon 4

FIG. 26

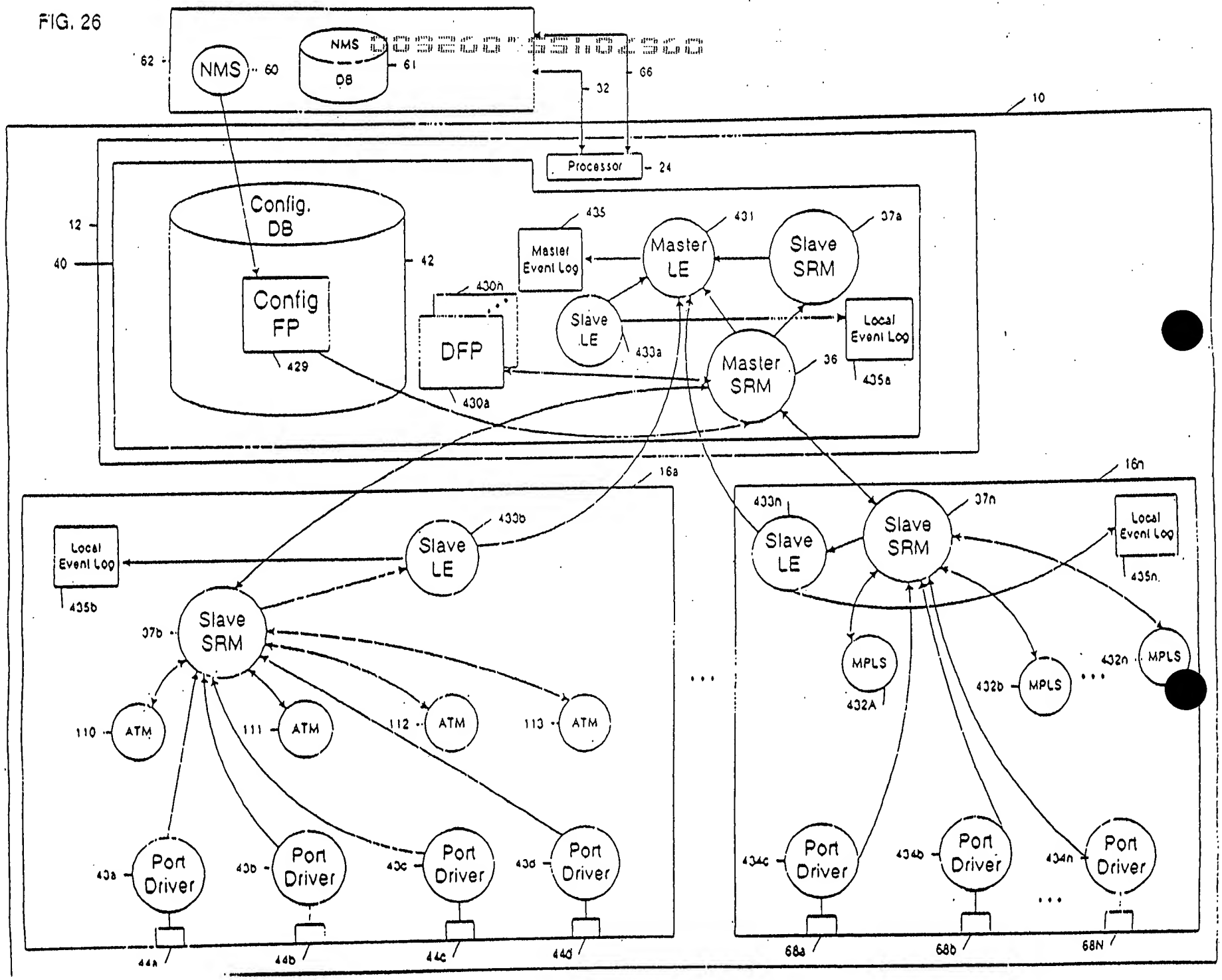

NMS
DB
62
60
61
66
32
10
Processor
24
12
40
Config. DB
42
Config FP
429
435
Master Event Log
431
Master LE
37a
Slave SRM
430n
DFP
430a
Slave LE
433a
Master SRM
36
Local Event Log
435a
16a
16n
Local Event Log
435b
433b
Slave LE
37b
Slave SRM
110
ATM
111
ATM
112
ATM
113
ATM
43a
Port Driver
43b
Port Driver
43c
Port Driver
43d
Port Driver
44a
44b
44c
44d
433n
Slave LE
37n
Slave SRM
Local Event Log
435n
MPLS
432A
MPLS
432b
MPLS
432n
434c
Port Driver
434b
Port Driver
434n
Port Driver
68a
68b
68N

FIG. 27

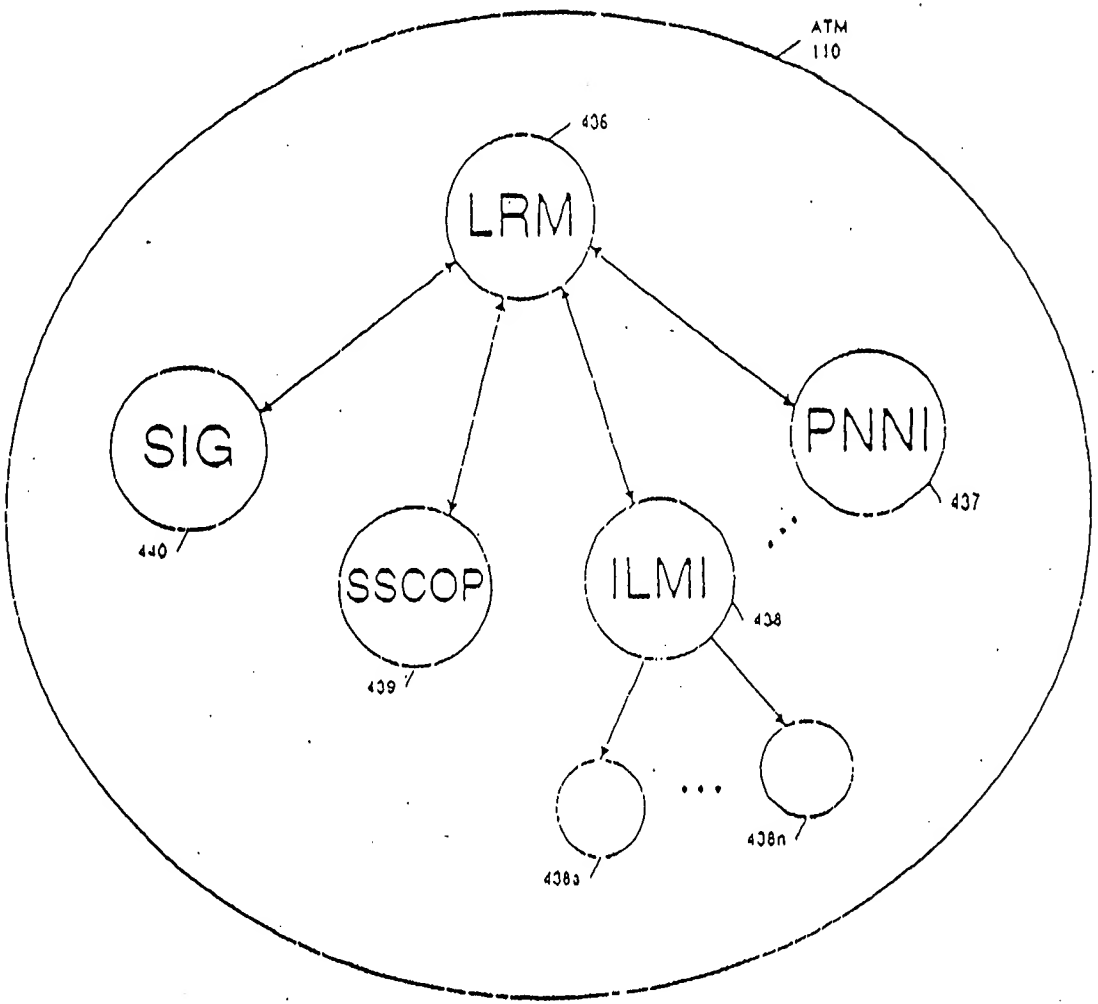


FIG. 28

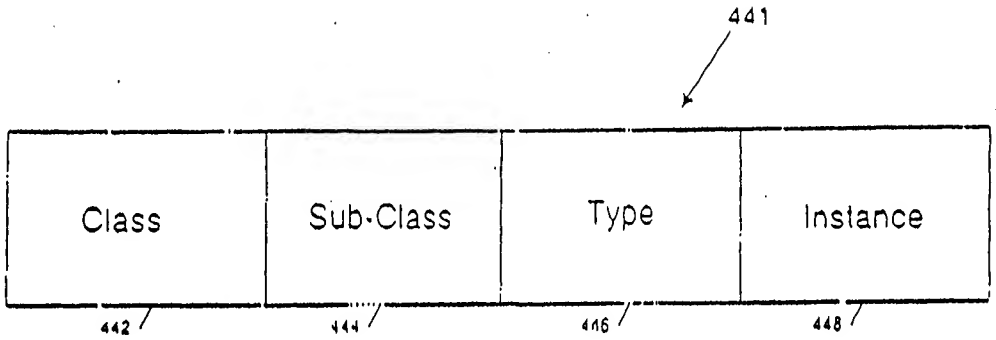


FIG. 29

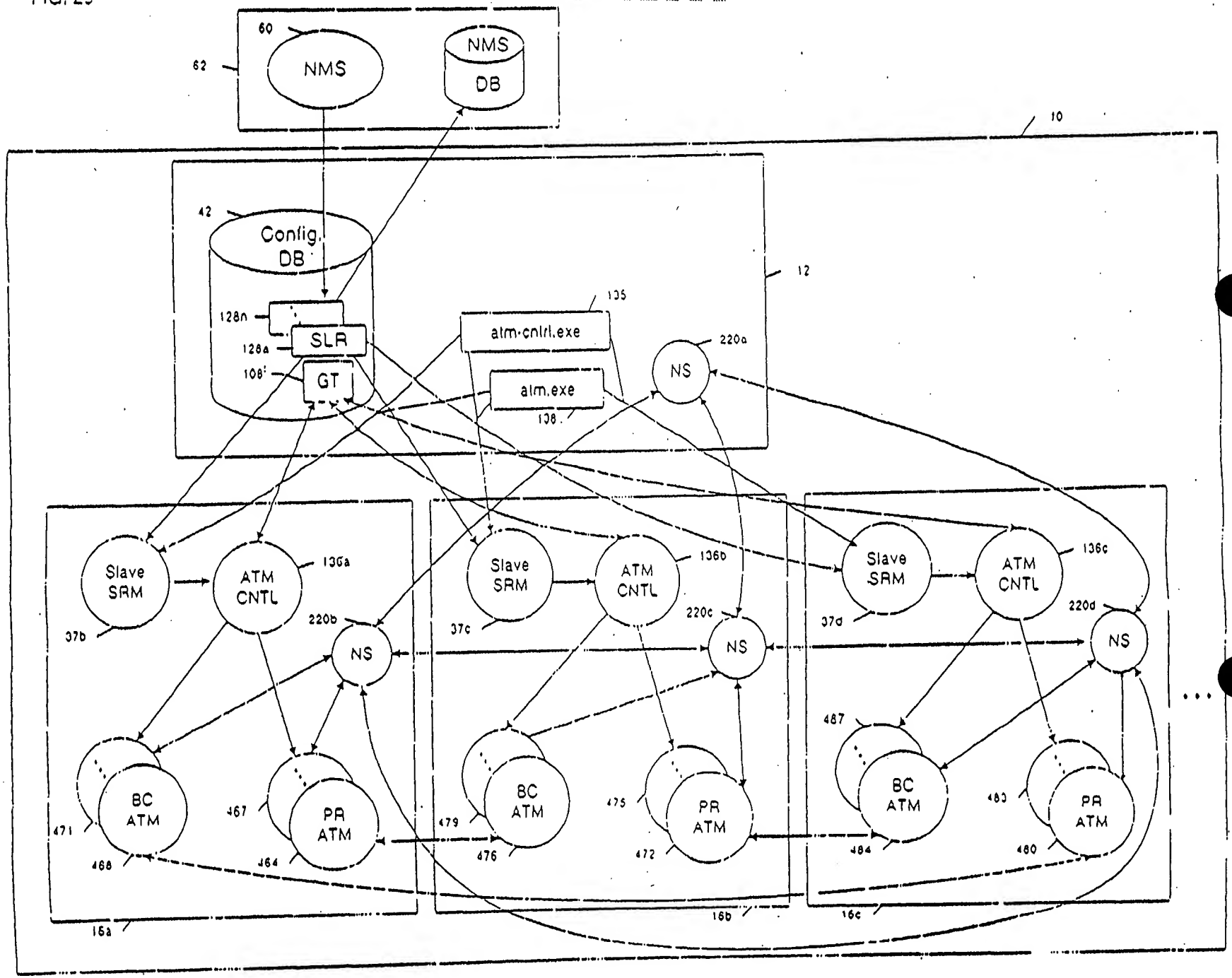

60
62
NMS
NMS
DB
10
12
42
Config.
DB
128n
128a
108'
SLR
GT
135
atm·cntrl.exe
atm.exe
138
220a
NS
Slave
SRM
ATM
CNTL
136a
37b
220b
NS
BC
ATM
471
468
PR
ATM
467
464
Slave
SRM
ATM
CNTL
136b
37c
220c
NS
BC
ATM
479
476
PR
ATM
475
472
Slave
SRM
ATM
CNTL
136c
37d
220d
NS
BC
ATM
487
484
PR
ATM
483
480
16a
16b
16c

FIG.30

oup Table 108'

	Group #	Primary Card LID (447)	Backup Card LID (449)	...
450	1	30	31	
451	2	30	31	
452	3	30	31	
453	4	30	31	
454	5	31	32	
455	6	31	32	
456	7	31	32	
457	8	31	32	
458	9	32	30	
459	10	32	30	
460	11	32	30	
461	12	32	30	
	⋮	⋮	⋮	⋮

Fig. 31a

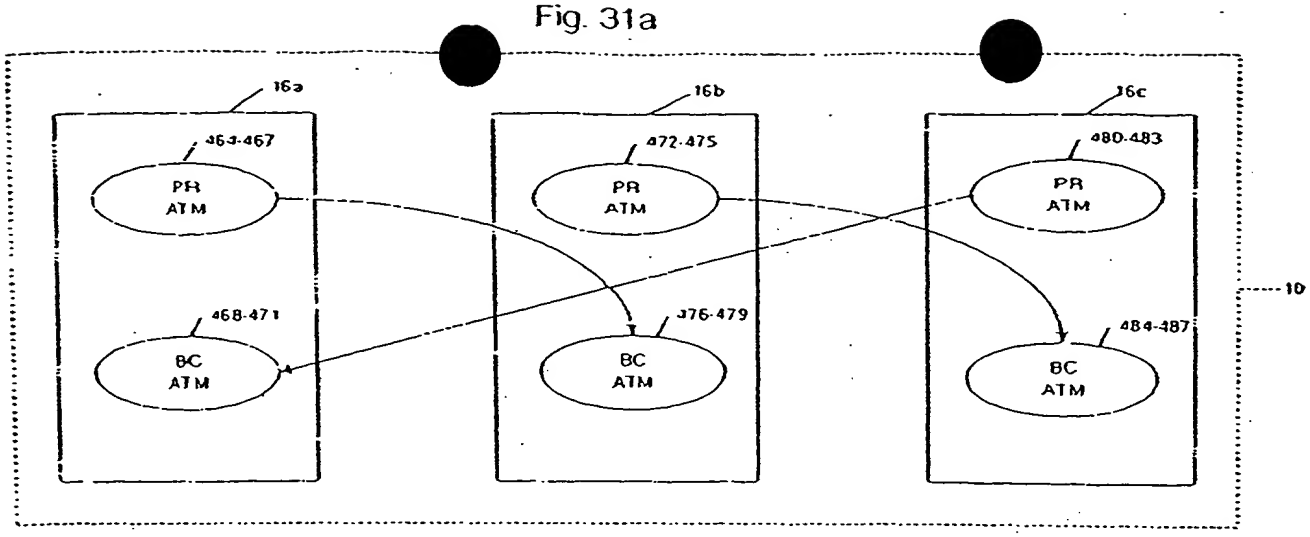


Fig. 31b

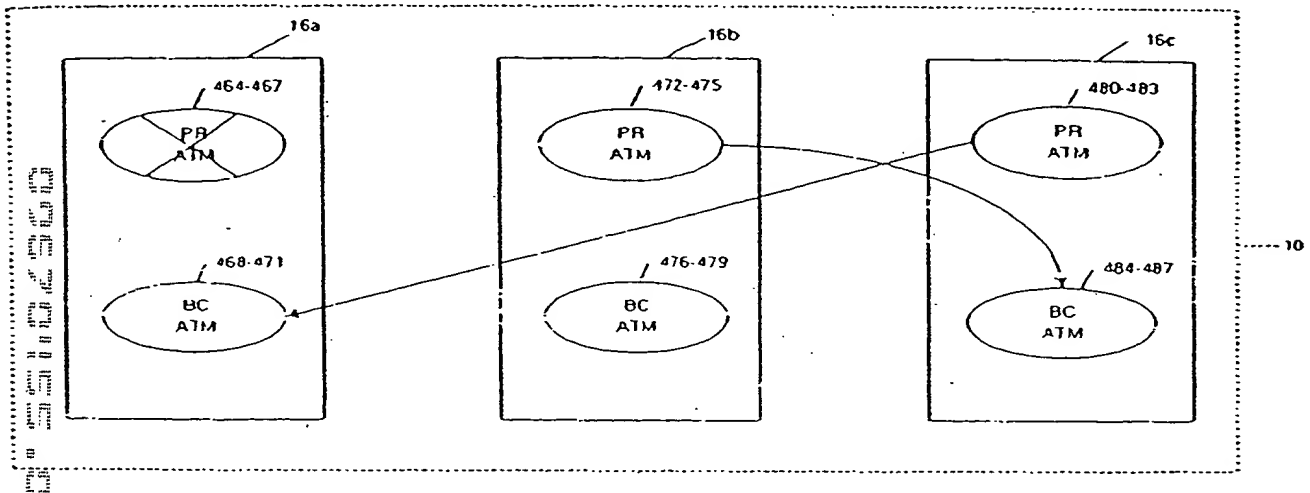


Fig. 31c

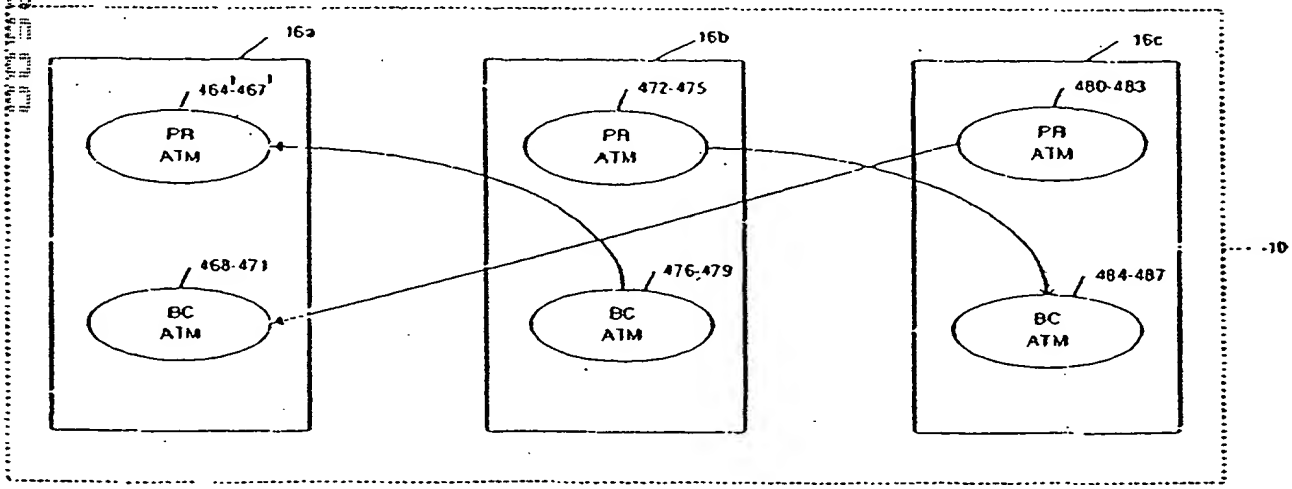


Fig. 32a

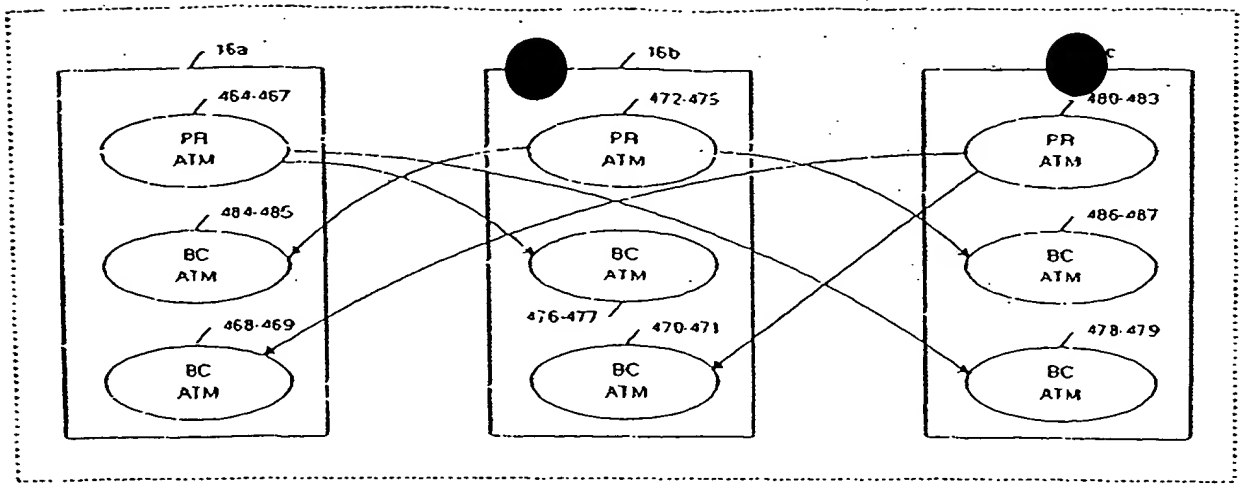


Fig. 32b

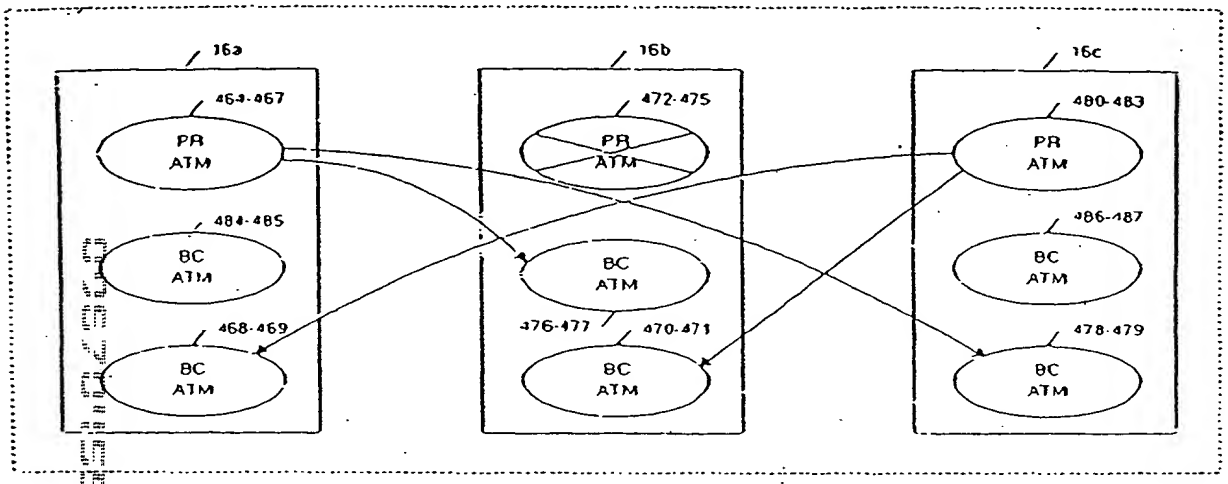
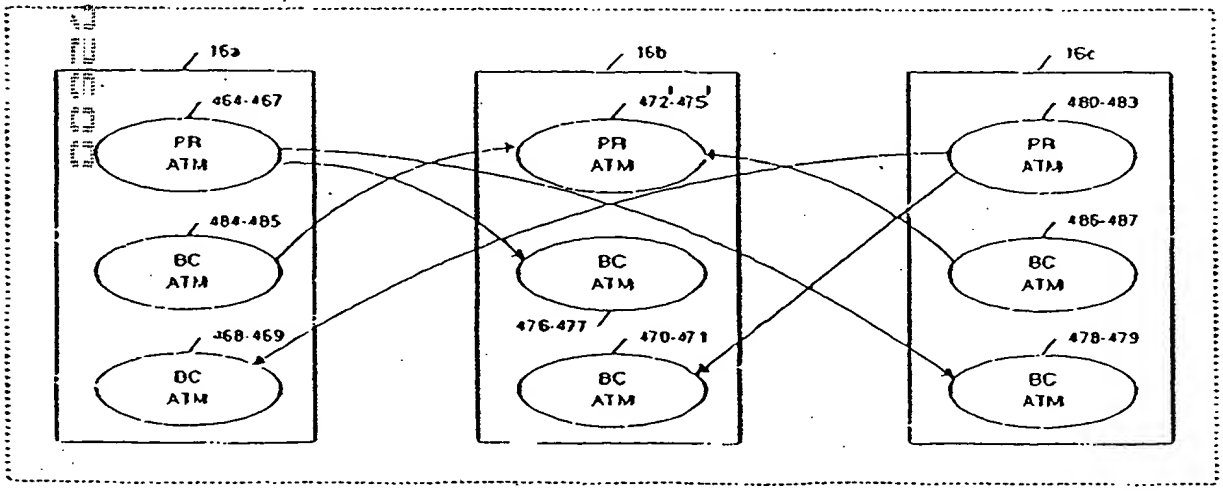
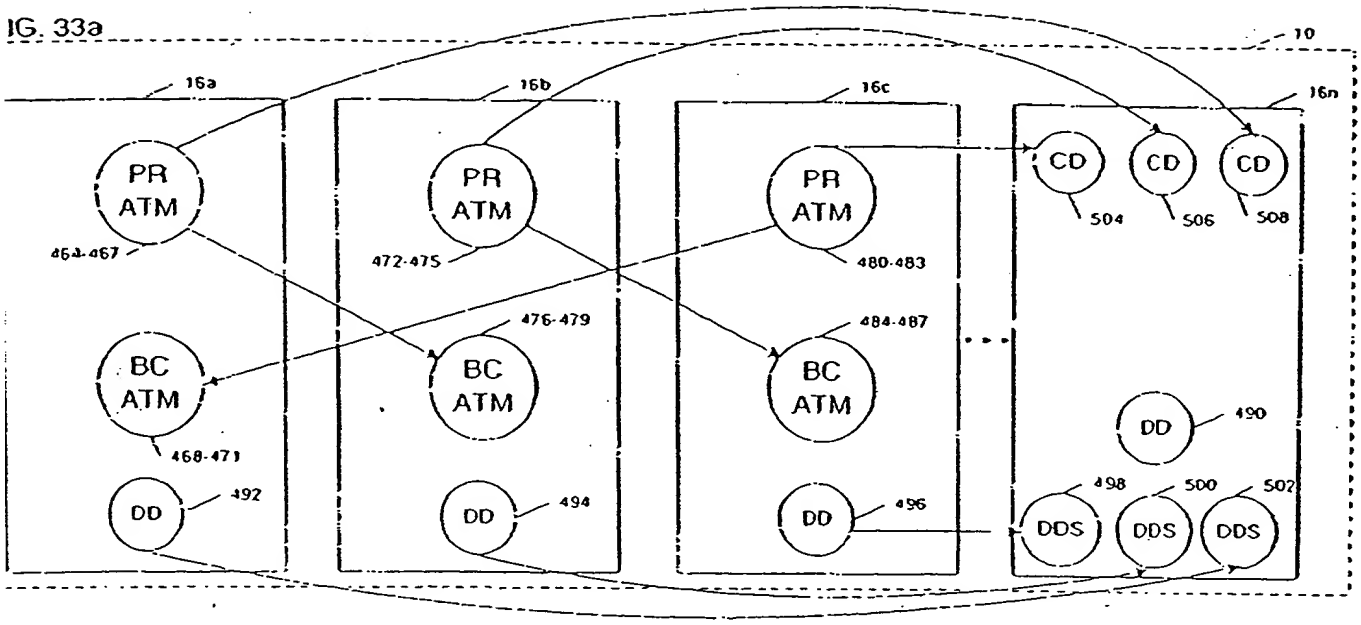


Fig. 32c



IG. 33a


10
16a
16b
16c
16n
PR ATM
464-467
472-475
480-483
BC ATM
468-471
476-479
484-487
DD
492
494
496
490
CD
504
506
508
DDS
498
500
502

IG. 33b

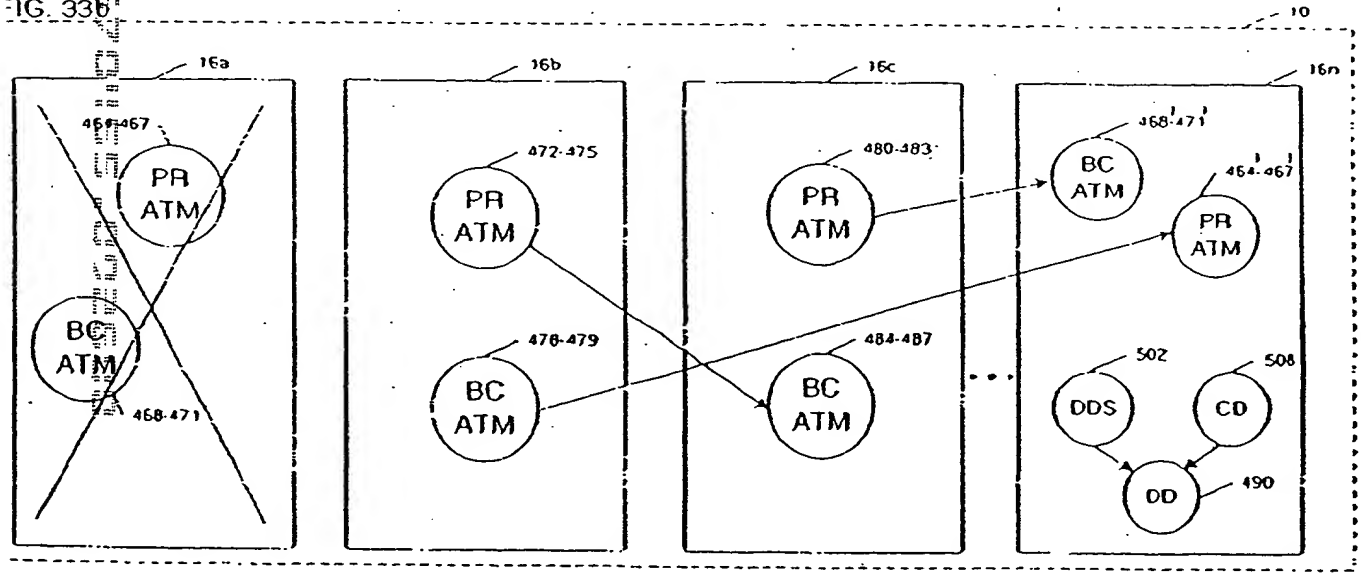

10
16a
16b
16c
16n
PR ATM
464-467
472-475
480-483
BC ATM
468-471
476-479
484-487
464'-467'
468'-471'
DDS
502
CD
508
DD
490

FIG. 33c

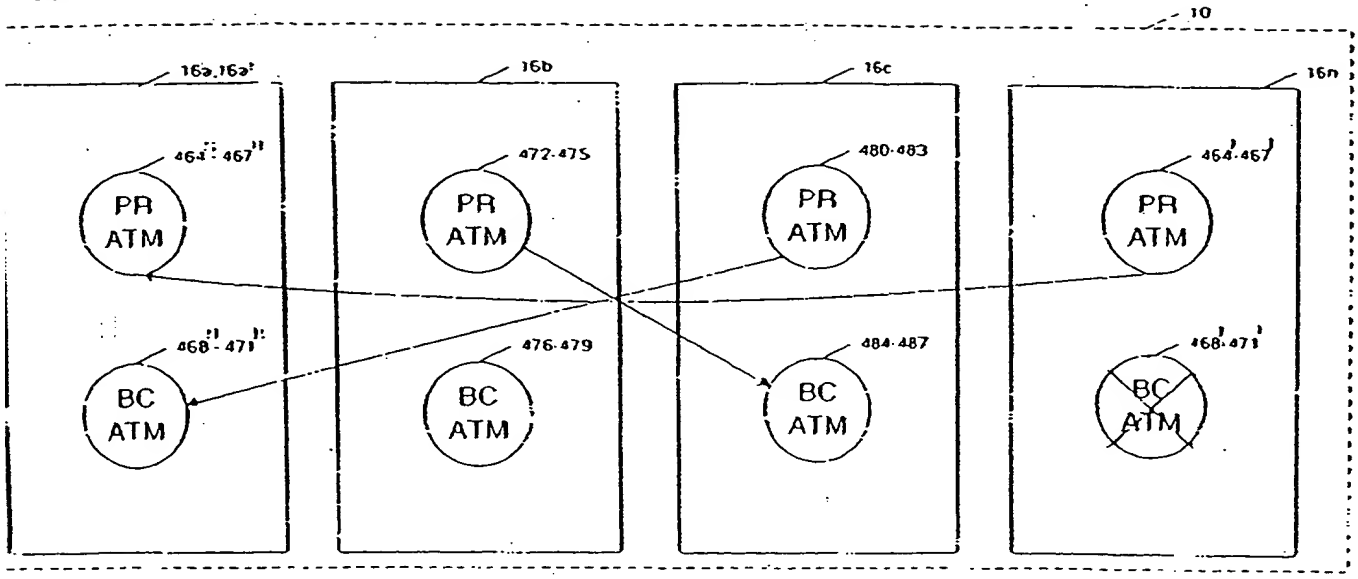


FIG. 33d

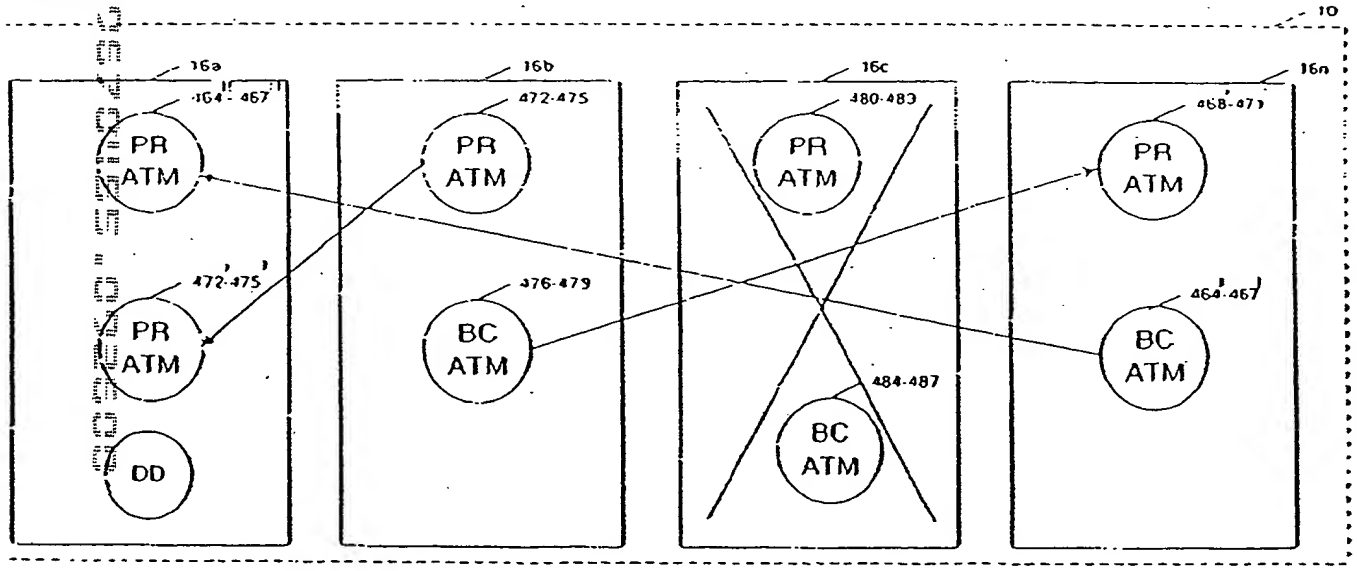


Fig. 34a

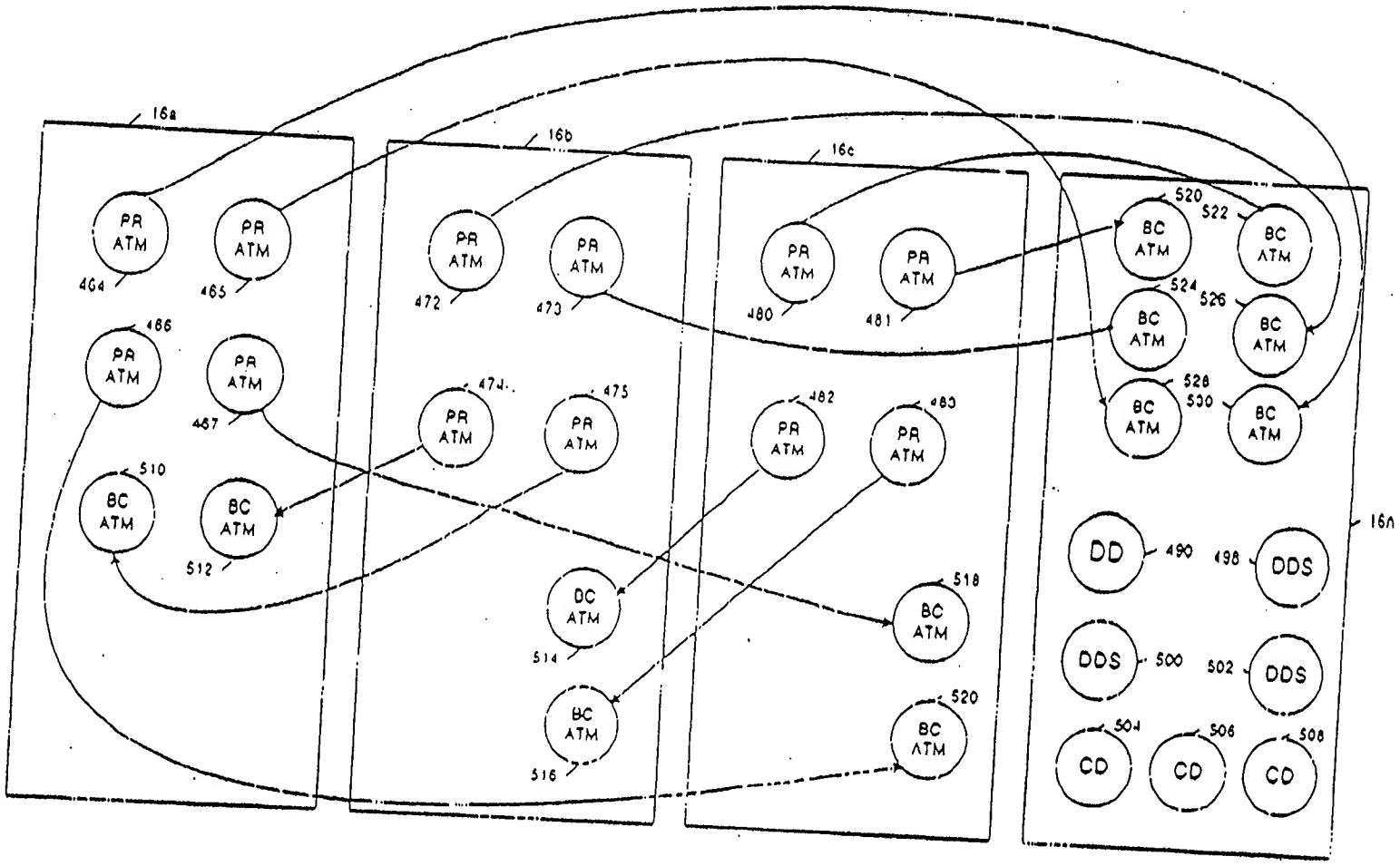
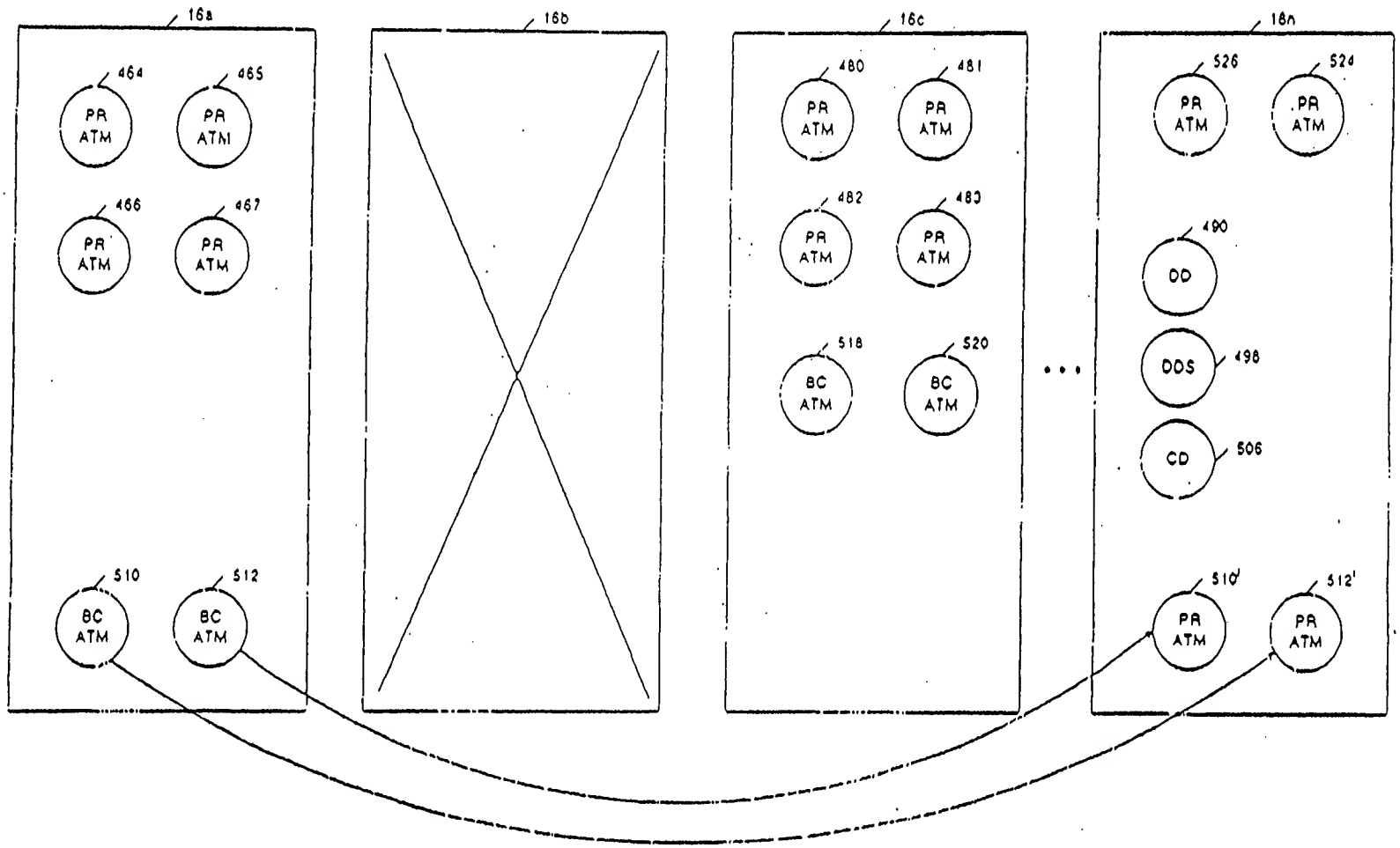

16a
16b
16c
16d
PR ATM
464
465
466
467
472
473
474
475
480
481
482
483
BC ATM
510
512
514
516
518
520
522
524
526
528
530
DD
490
498
DDS
500
502
CD
504
506
508

FIG. 34b


16a
16b
16c
16n
464
PR ATM
465
PR ATM
466
PR ATM
467
PR ATM
480
PR ATM
481
PR ATM
482
PR ATM
483
PR ATM
518
BC ATM
520
BC ATM
526
PR ATM
524
PR ATM
490
DD
498
DDS
506
CD
510
BC ATM
512
BC ATM
510'
PR ATM
512'
PR ATM

NMS
Quadrant 1
(Redundant) Forwarding Card
Forwarding Card
Quadrant 2
(Redundant) Forwarding Card
Forwarding Card
Quadrant 3
(Redundant) Forwarding Card
Forwarding Card
Quadrant 4
(Redundant) Forwarding Card
Forwarding Card
Switching Fabric Card (SF)
Universal Port Card
Cross Connect Card

FIG. 35

FIG. 36

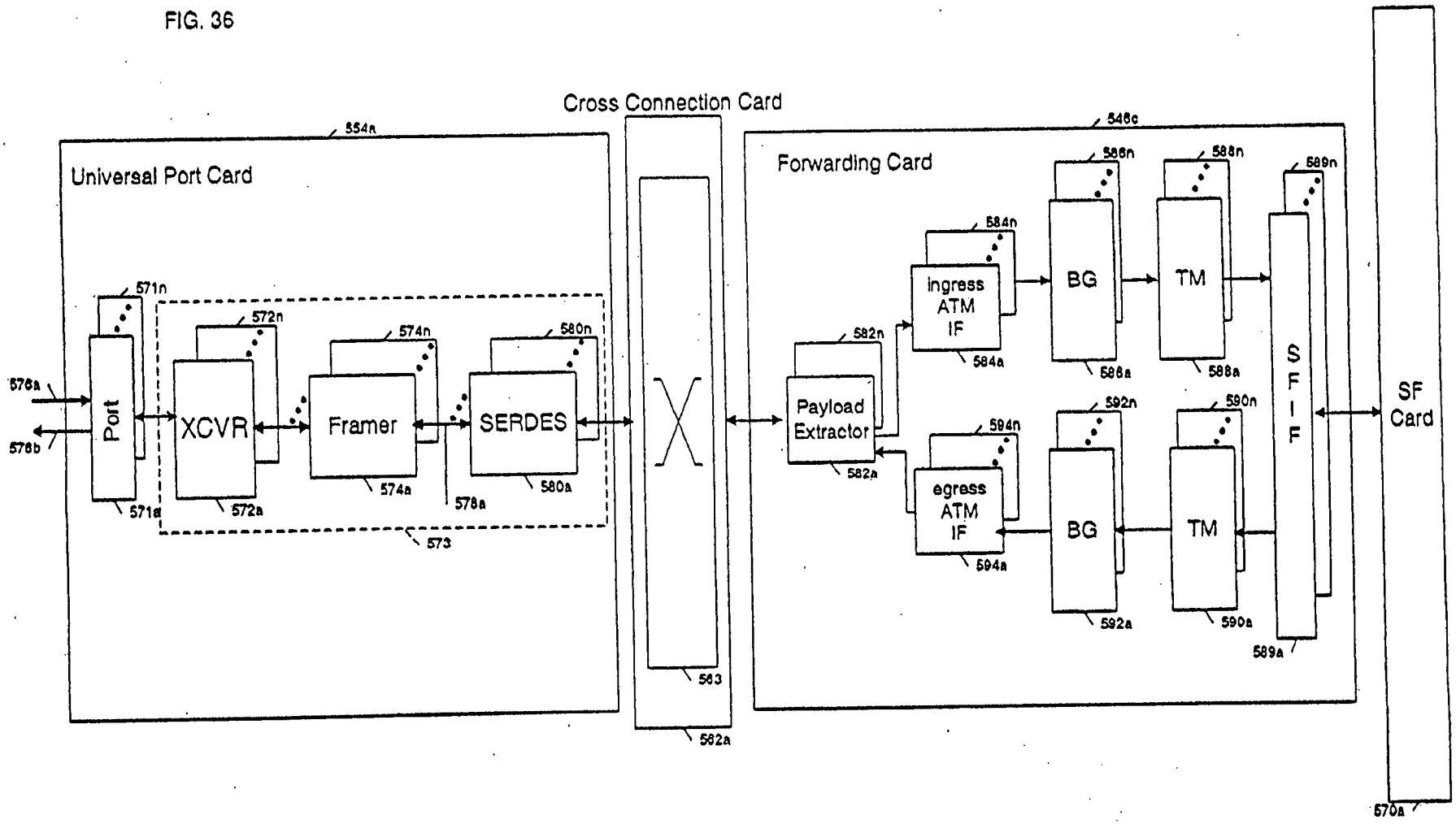


FIG. 37

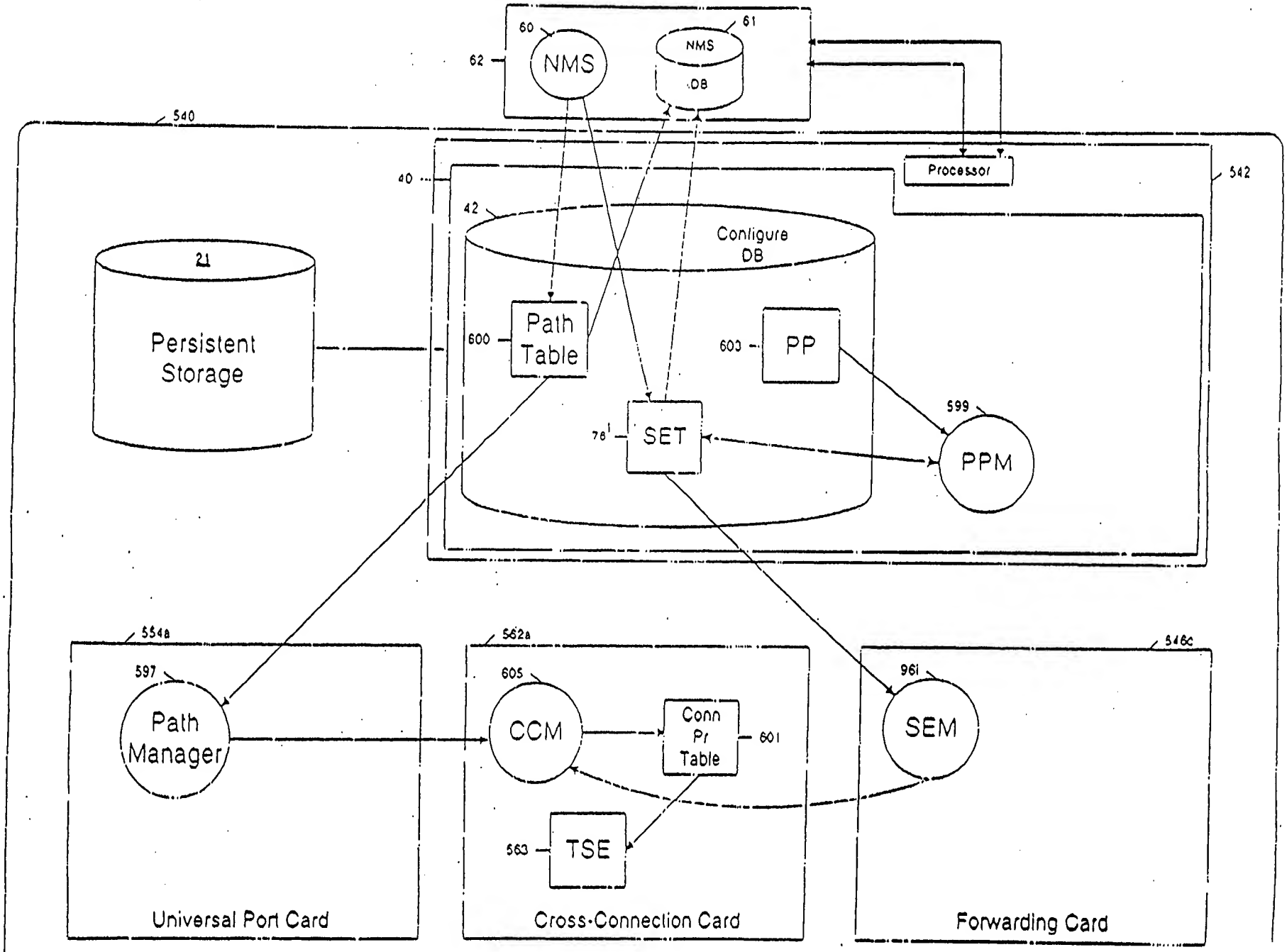

60
NMS
62
61
NMS
DB
540
542
Processor
40
42
Configure DB
21
Persistent Storage
600
Path Table
603
PP
599
781
SET
PPM
554a
597
Path Manager
562a
605
CCM
Conn Pr Table
601
563
TSE
546c
961
SEM
Universal Port Card
Cross-Connection Card
Forwarding Card

FIG. 38

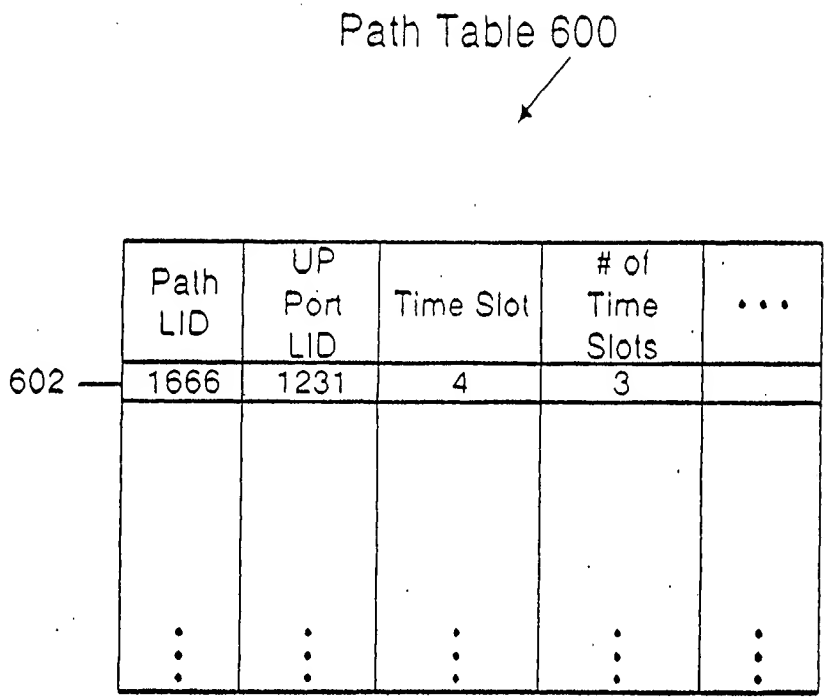

Path Table 600
Path LID
UP Port LID
Time Slot
# of Time Slots
• • •
602
1666
1231
4
3

FIG. 39

Service End Point Table 76'

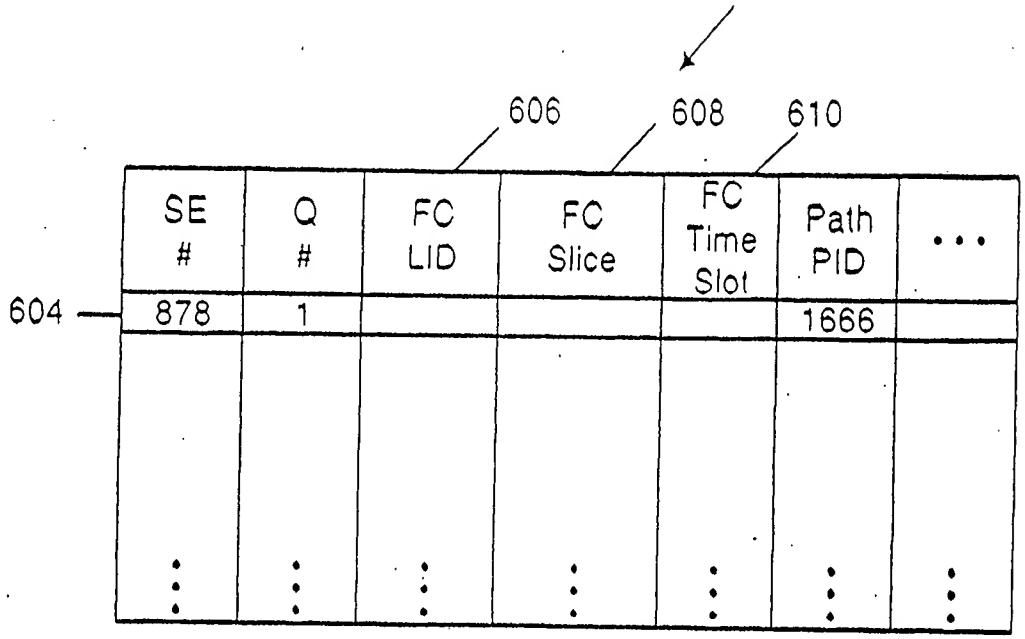


Fig. 40

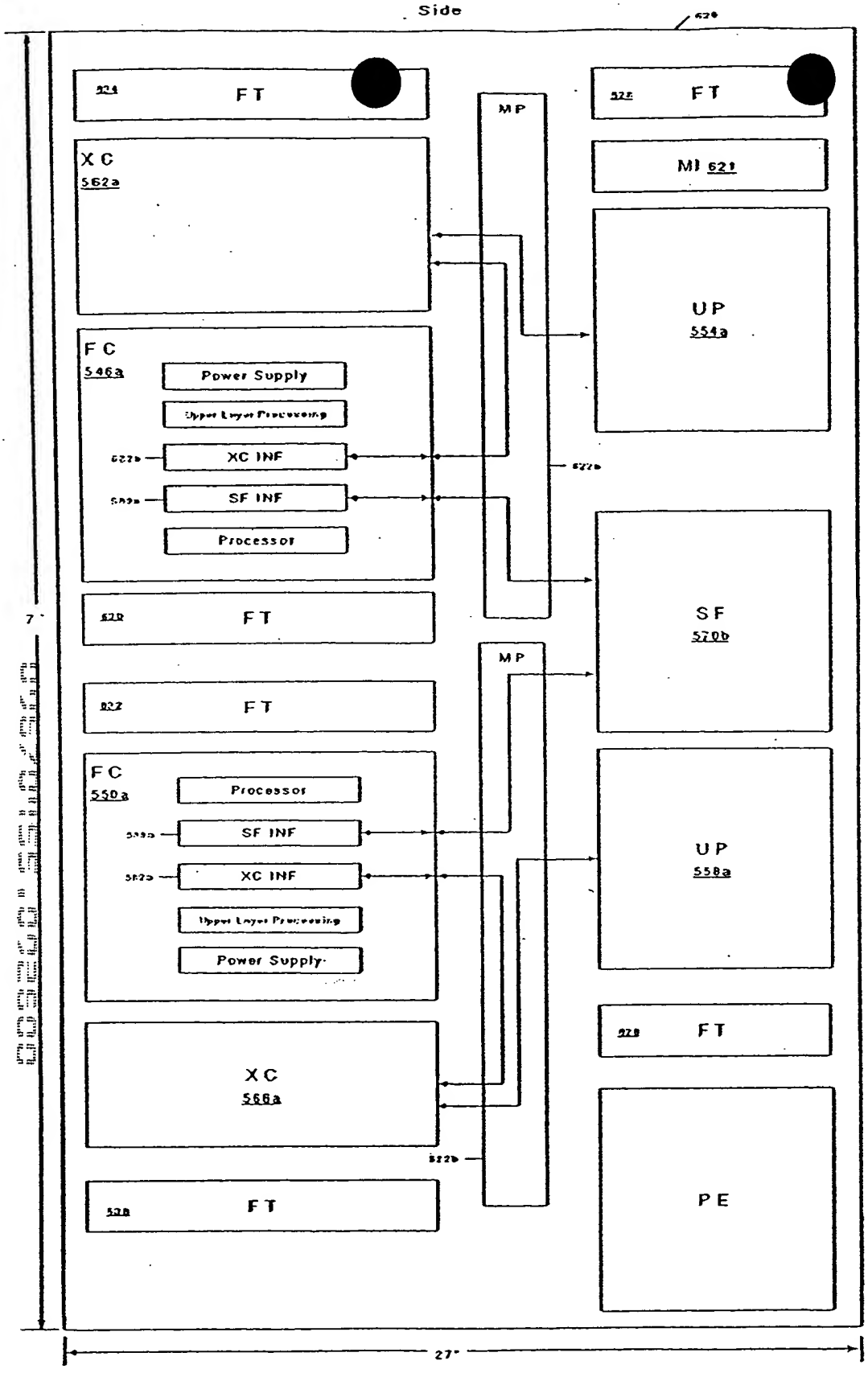

Side
FT
MP
FT
XC
562a
MI 621
UP
554a
FC
546a
Power Supply
XC INF
SF INF
Processor
FT
SF
570b
MP
FT
FC
550a
Processor
SF INF
XC INF
Power Supply
UP
558a
FT
XC
566a
FT
PE
7'
27'

FIGURE 41C

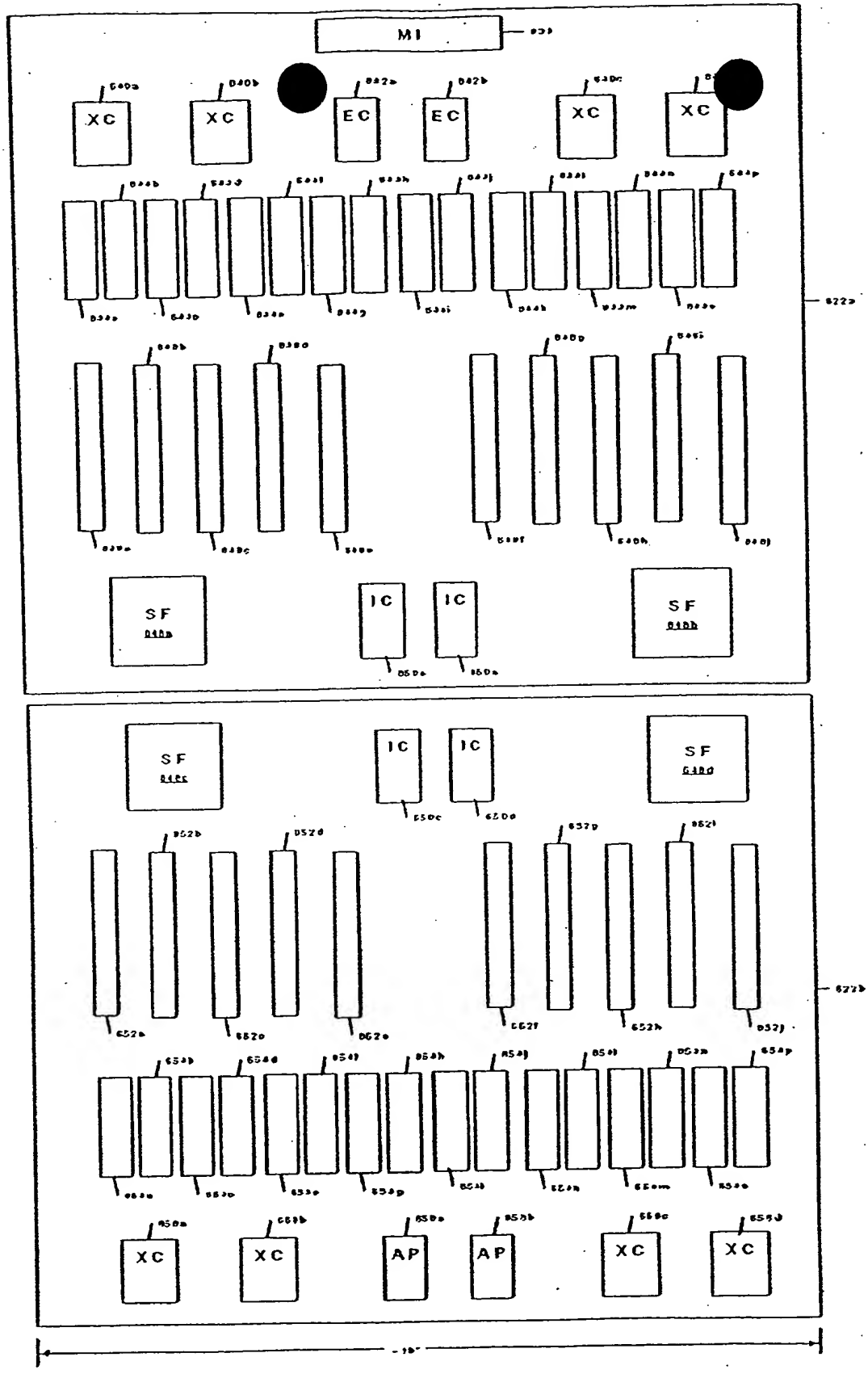


FIGURE 42

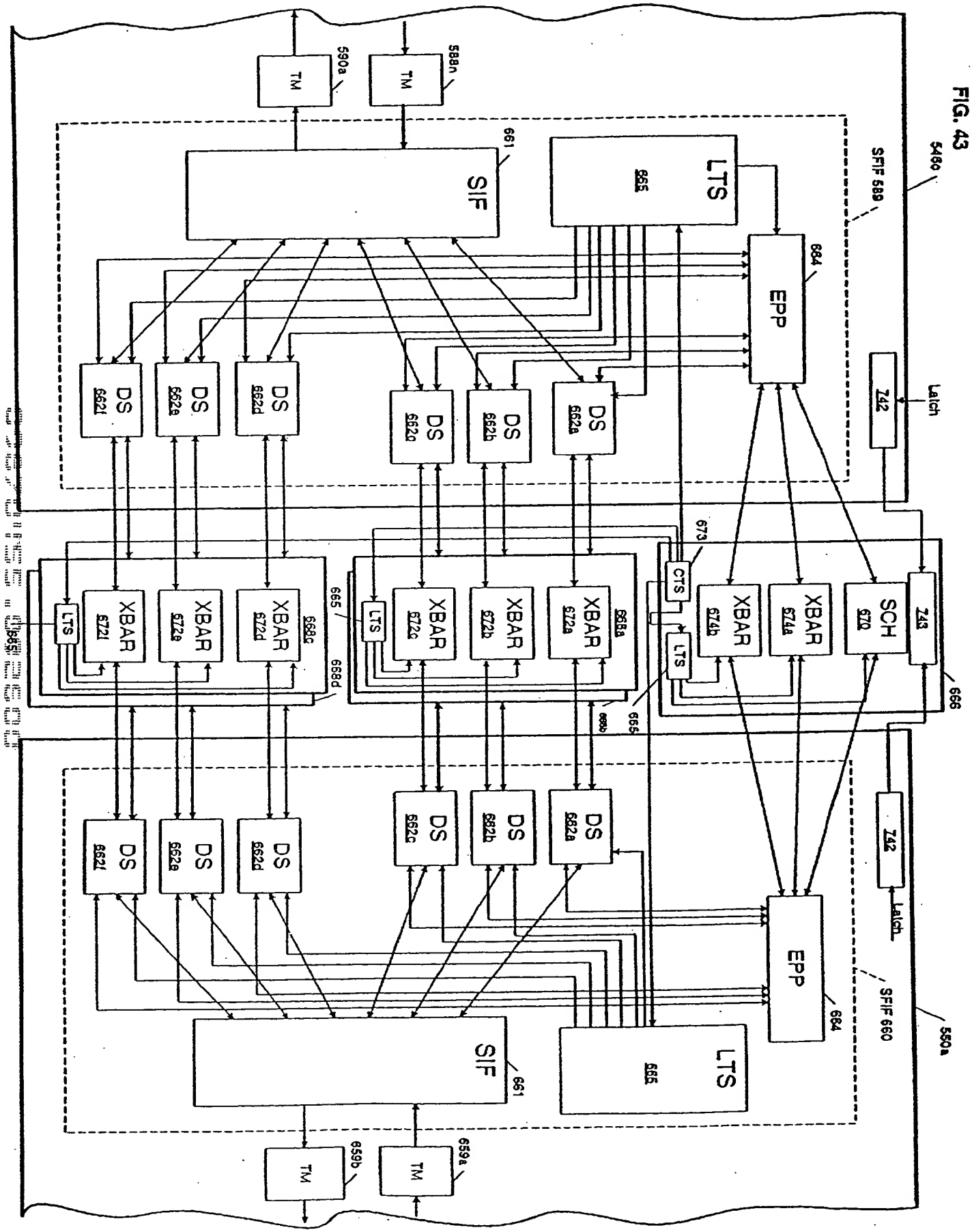

TM
590a
TM
588n
SIF
661
LTS
565
SFIF 589
550c
EPP
684
DS
662f
DS
662e
DS
662d
DS
662c
DS
662b
DS
662a
742
Latch
673
CTS
LTS
XBAR
672f
XBAR
672e
XBAR
672d
668c
665
XBAR
672c
XBAR
672b
XBAR
672a
668a
XBAR
674b
XBAR
674a
SCH
670
743
666
668d
668b
655
SFIF 660
550a
TM
659b
TM
659a

FIG. 43

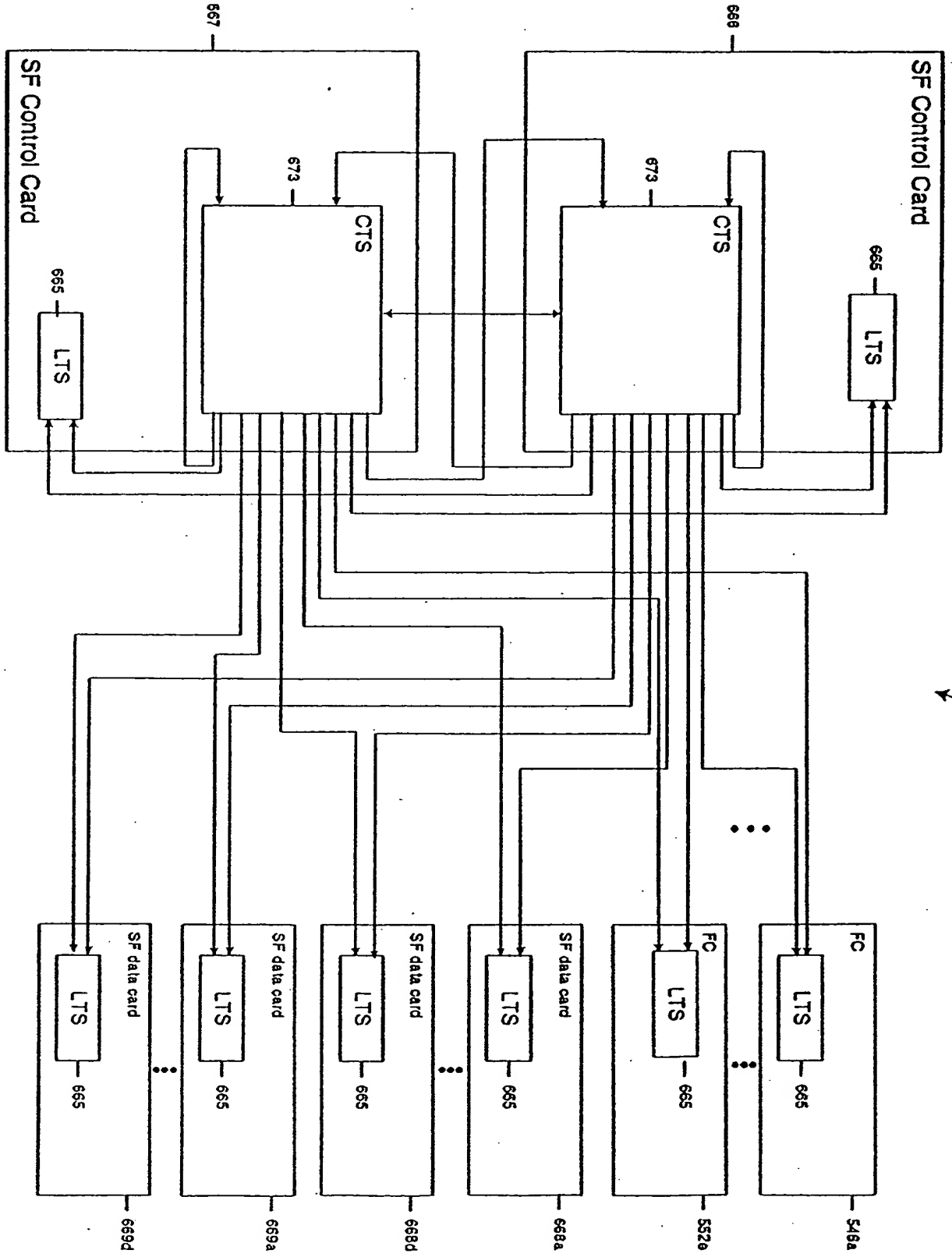
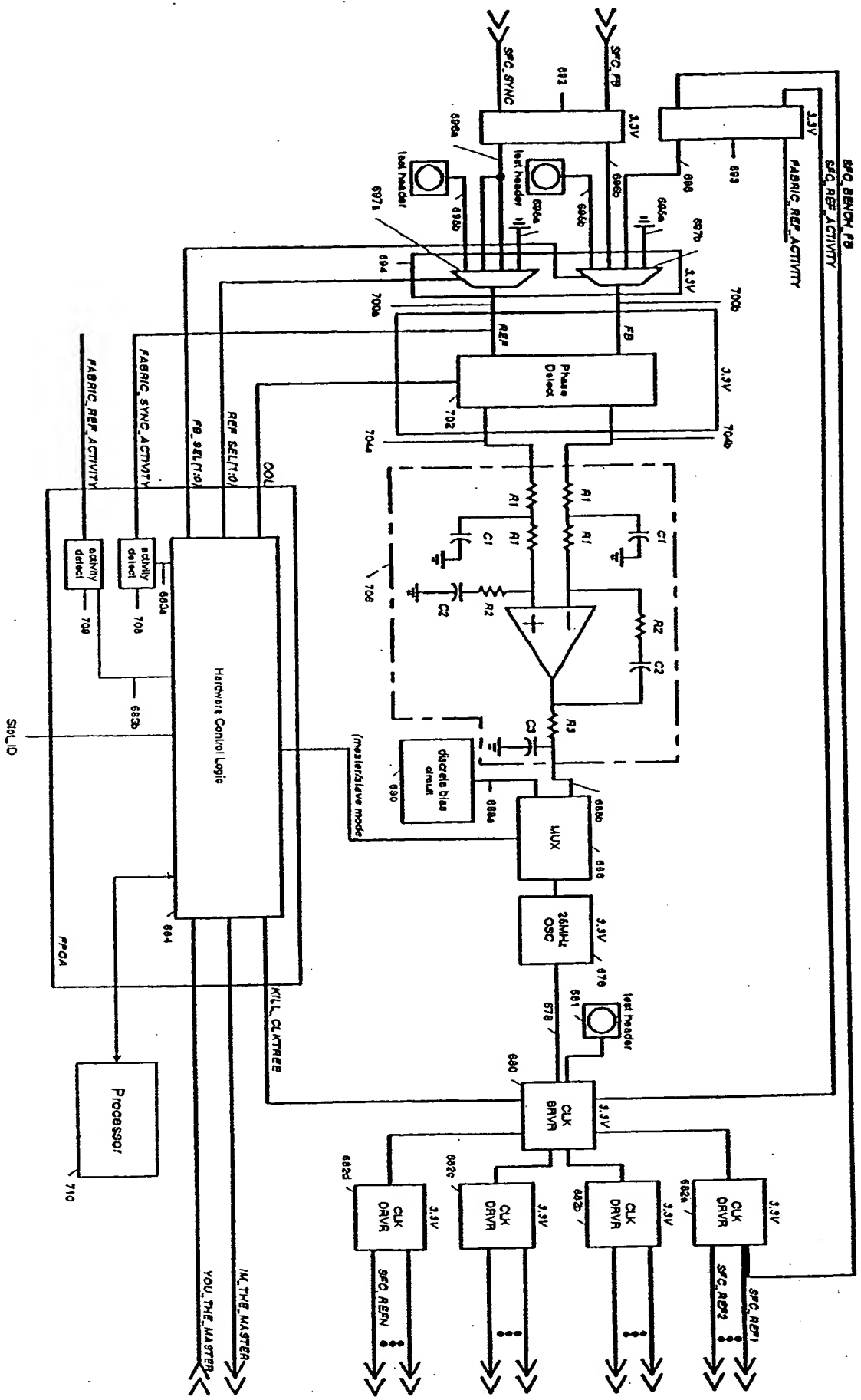

667
666
SF Control Card
SF Control Card
673
673
CTS
CTS
665
665
LTS
LTS
540
SF data card
SF data card
SF data card
SF data card
FC
FC
LTS
LTS
LTS
LTS
LTS
LTS
665
665
665
665
665
665
669d
669a
668d
668a
552e
546a

FIG. 44


SFC_SYNC
SFC_FB
692
3.3V
696a
696b
test header
693
SFC_BENCH_FB
SFC_REF_ACTIVITY
FABRIC_REF_ACTIVITY
697a
697b
694
700a
700b
REF
FB
Phase Detect
702
704a
704b
FABRIC_REF_ACTIVITY
FABRIC_SYNC_ACTIVITY
FB_SEL[1:0]
REF_SEL[1:0]
OOL
R1
C1
R2
C2
R3
708
activity detect
709
710
684a
684b
Hardware Control Logic
SloLID
FPGA
684
Processor
discrete bias circuit
630
(master/slave mode)
688a
MUX
688
26MHz OSC
3.3V
676
678
681
test header
680
CLK DRVR
682d
682c
682b
682a
KILL_CLKTREE
YOU_THE_MASTER
IM_THE_MASTER
SFC_REFn
SFC_REF3
SFC_REF2
SFC_REF1
FIG. 45
CTS
673

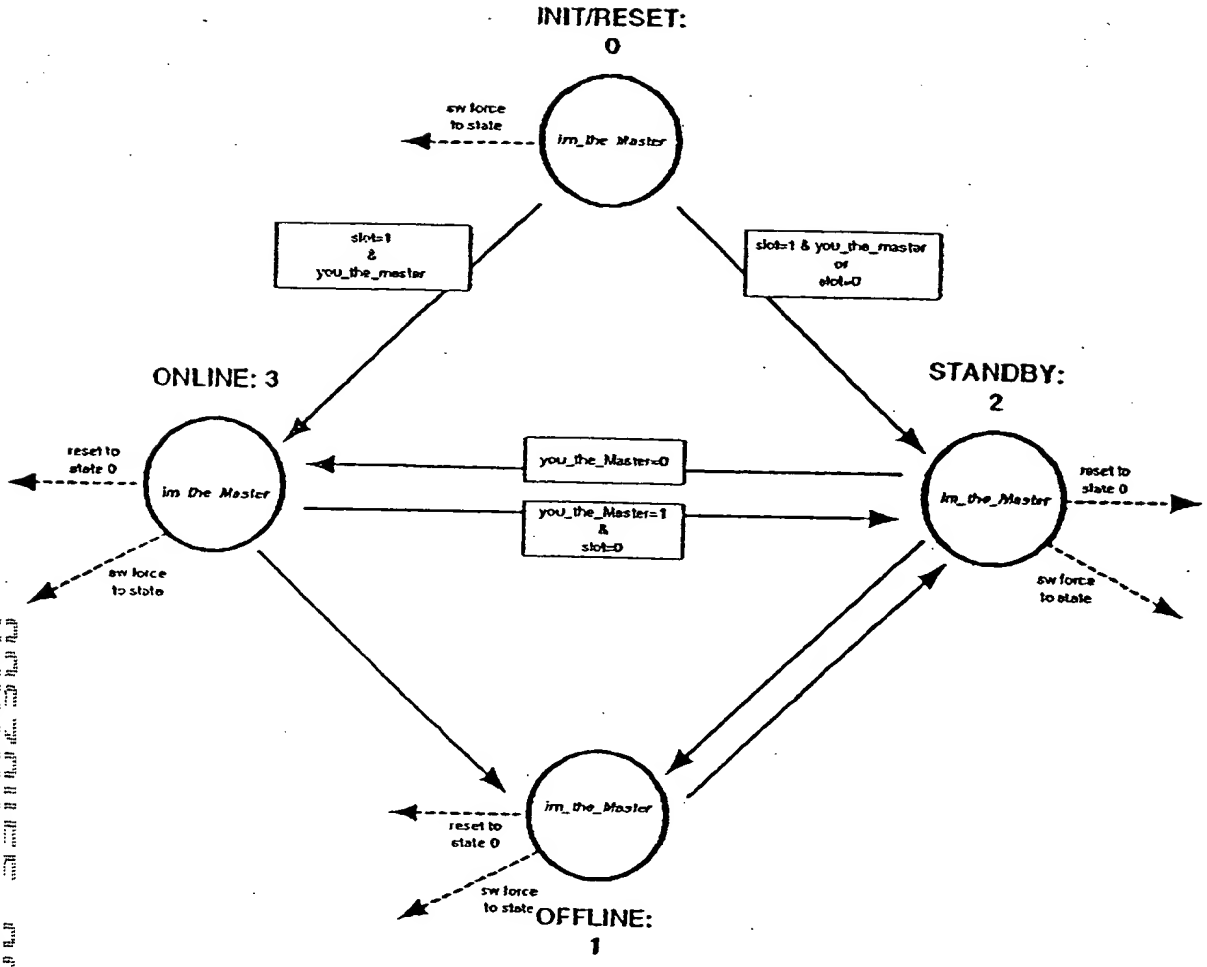

INIT/RESET:
0
sw force
to state
im_the_Master
slot=1
&
you_the_master
slot=1 & you_the_master
or
slot=0
ONLINE: 3
STANDBY:
2
reset to
state 0
im_the_Master
you_the_Master=0
you_the_Master=1
&
slot=0
im_the_Master
reset to
state 0
sw force
to state
sw force
to state
im_the_Master
reset to
state 0
sw force
to state
OFFLINE:
1

FIG. 46

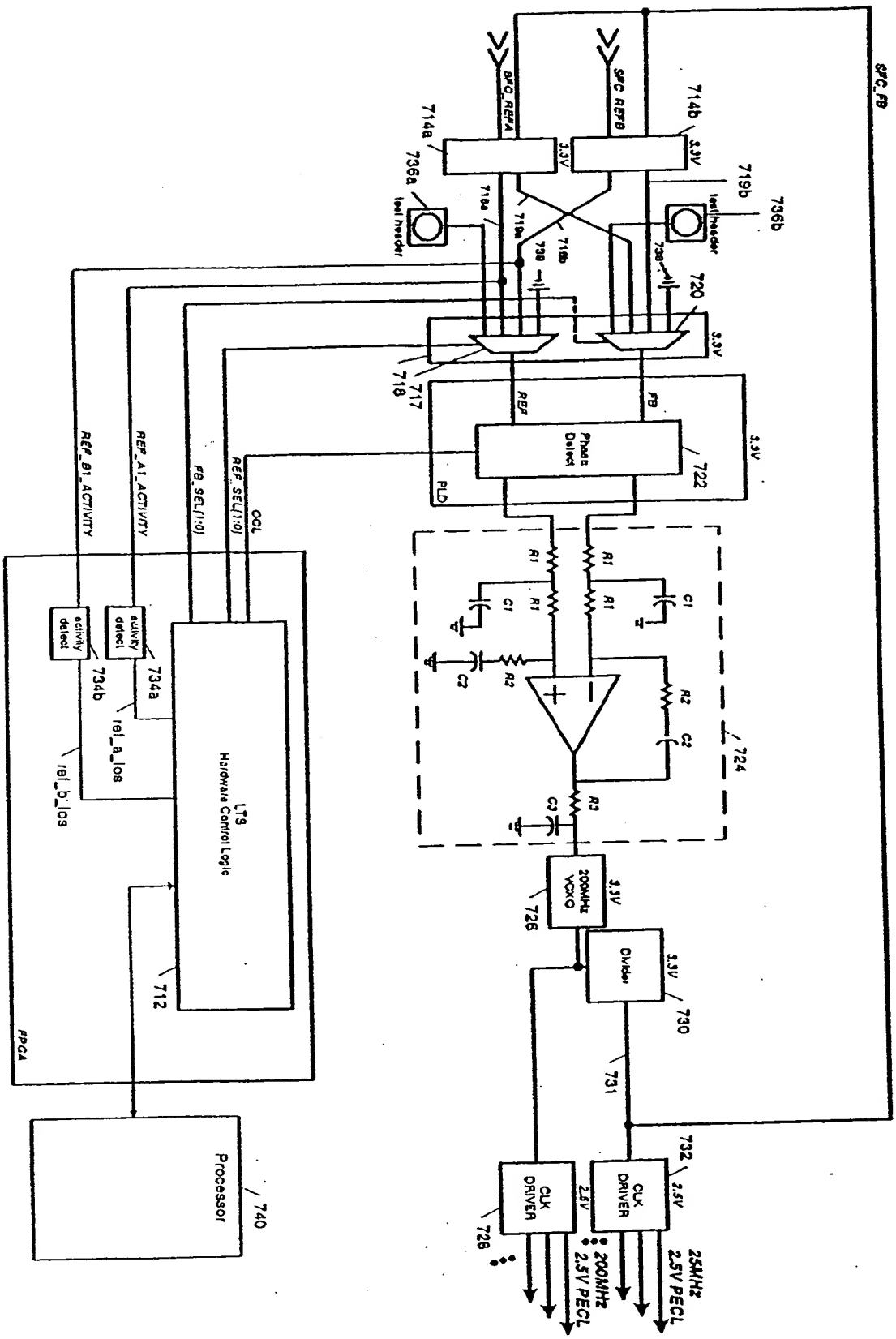

LTS
665
SFC_FB
SFC_REFA
SFC REFB
714a
714b
3.3V
736a
736b
Ref/Feedback
719a
719b
738
720
717
718
REF
FB
Phase Detect
722
PLD
724
R1
C1
R2
C2
R3
C3
200MHz VCXO
726
Divider
730
731
732
CLK DRIVER
2.5V
728
200MHz 2.5V PECL
25MHz 2.5V PECL
REF_B1_ACTIVITY
REF_A1_ACTIVITY
FB_SEL(1:0)
REF_SEL(1:0)
OOL
activity detect
734a
734b
ref_a_los
ref_b_los
LTS Hardware Control Logic
712
FPGA
Processor
740

FIG. 47

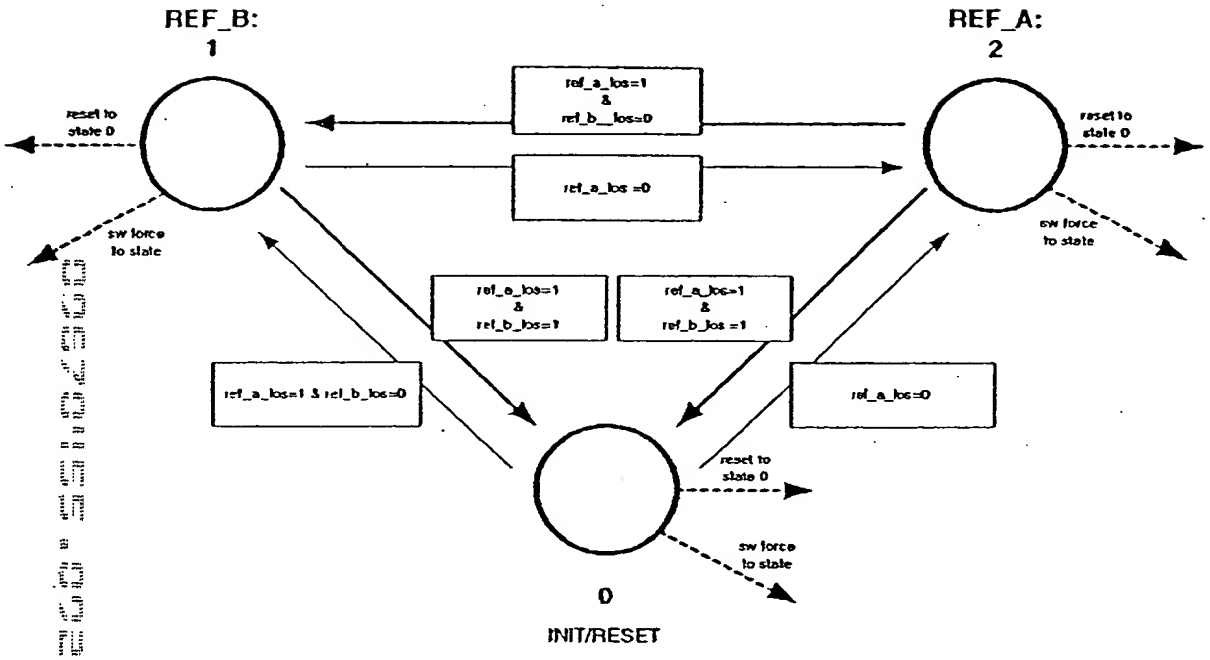

REF_B:
1
REF_A:
2
reset to state 0
sw force to state
ref_a_los=1 & ref_b_los=0
ref_a_los =0
ref_a_los=1 & ref_b_los=1
ref_a_los=1 & ref_b_los =1
ref_a_los=1 & ref_b_los=0
ref_a_los=0
0
INIT/RESET

FIG. 48

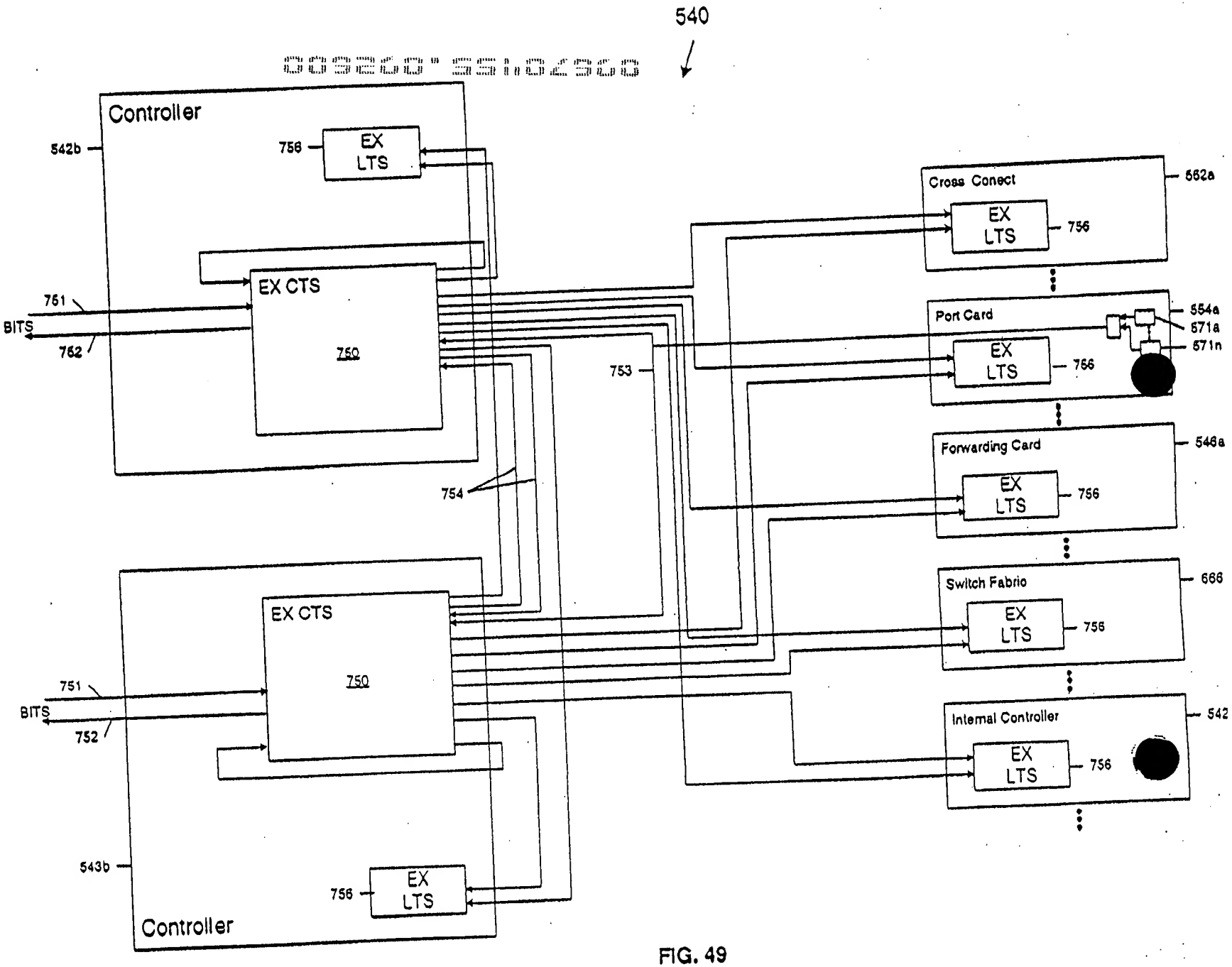


FIG. 49

EXCTS 750

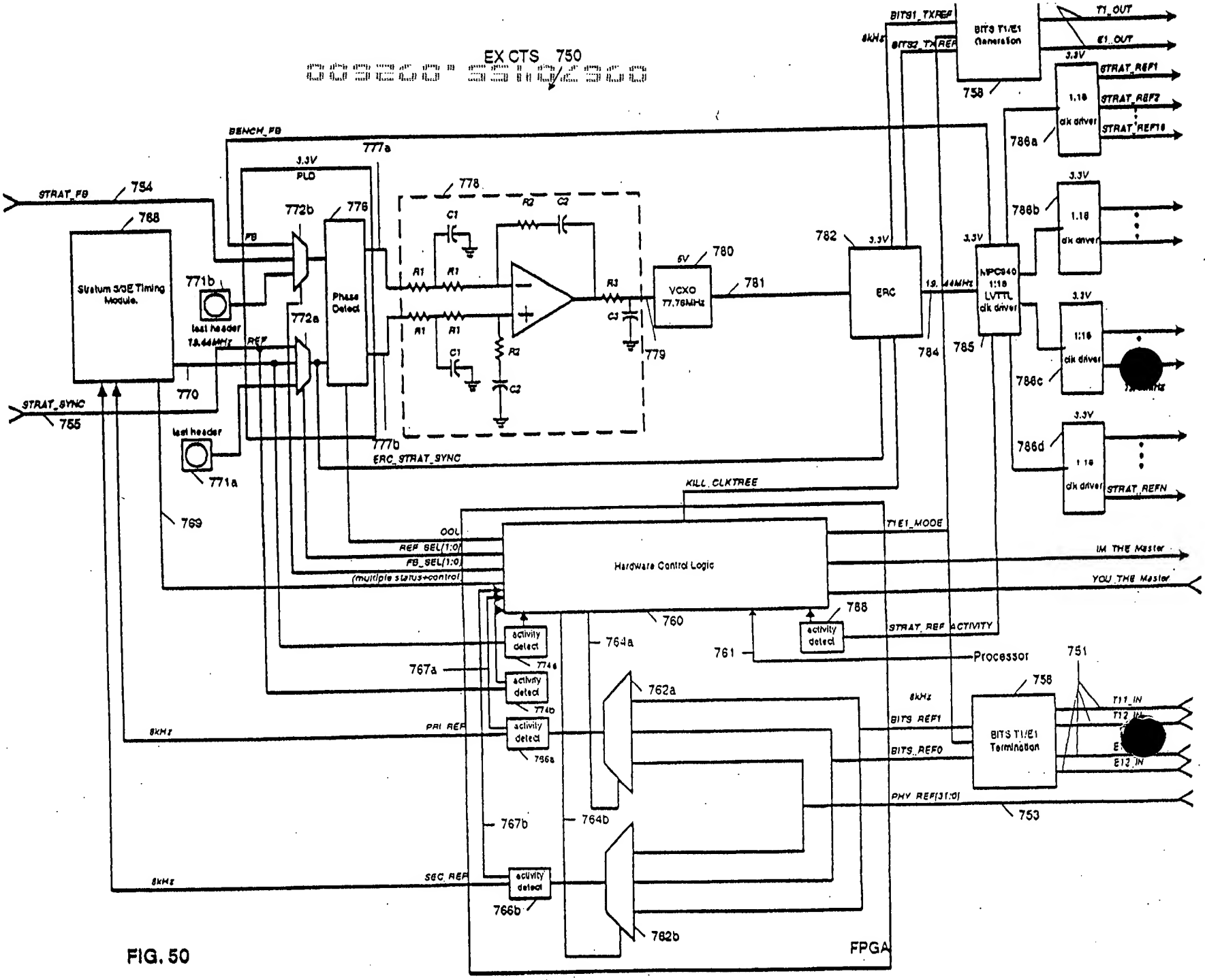


FIG. 50

8kHz
25%
75%
19.44 MHz
790
790
784
781
77.78MHz
time
19.44 MHz with embedded 8kHz
8kHz (pulse)
8kHz (50% duty)

FIG. 51

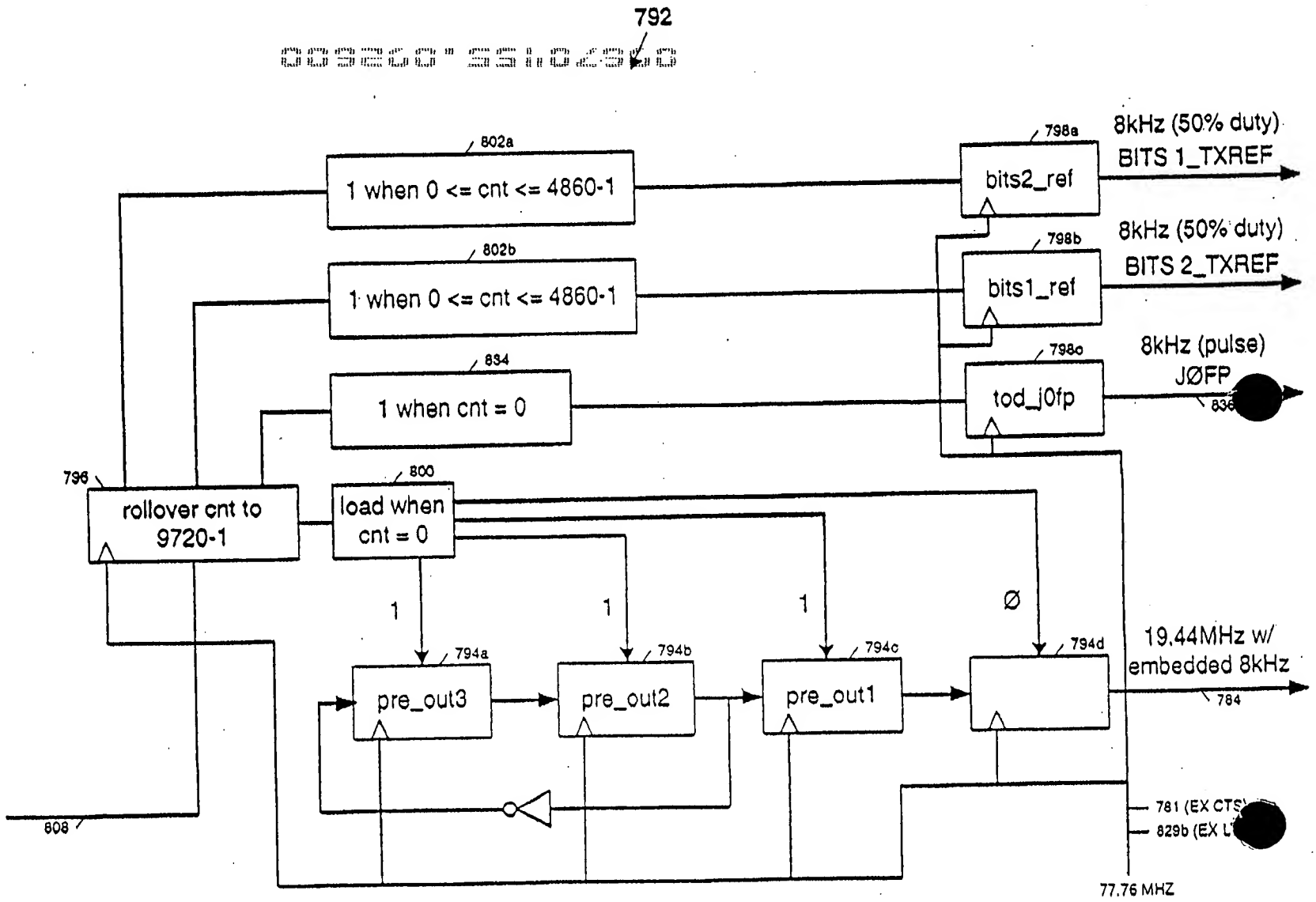

792
802a
1 when 0 <= cnt <= 4860-1
802b
1 when 0 <= cnt <= 4860-1
834
1 when cnt = 0
796
rollover cnt to 9720-1
800
load when cnt = 0
798a
bits2_ref
8kHz (50% duty) BITS 1_TXREF
798b
bits1_ref
8kHz (50% duty) BITS 2_TXREF
798c
tod_j0fp
8kHz (pulse) JØFP
836
1
1
1
Ø
794a
pre_out3
794b
pre_out2
794c
pre_out1
794d
19.44MHz w/ embedded 8kHz
784
808
781 (EX CTS)
829b (EX L
77.76 MHZ

Fig. 52

804
ERC_STRAT_SYNC (EX CTS)
STRAT_REF_A or STRAT_REF_B(EX LTS) 832
19.44MHz with encoded 8kHz
(must be pulled low when not present)
77.76MHz pld
clock
1
reg1
reg2
reg3
806a
806b
806c
8kHz pulse used to reset
counter in generation circuit
808
781 (EX CTS)
829b (EX LTS)
Extractor

FIG. 53

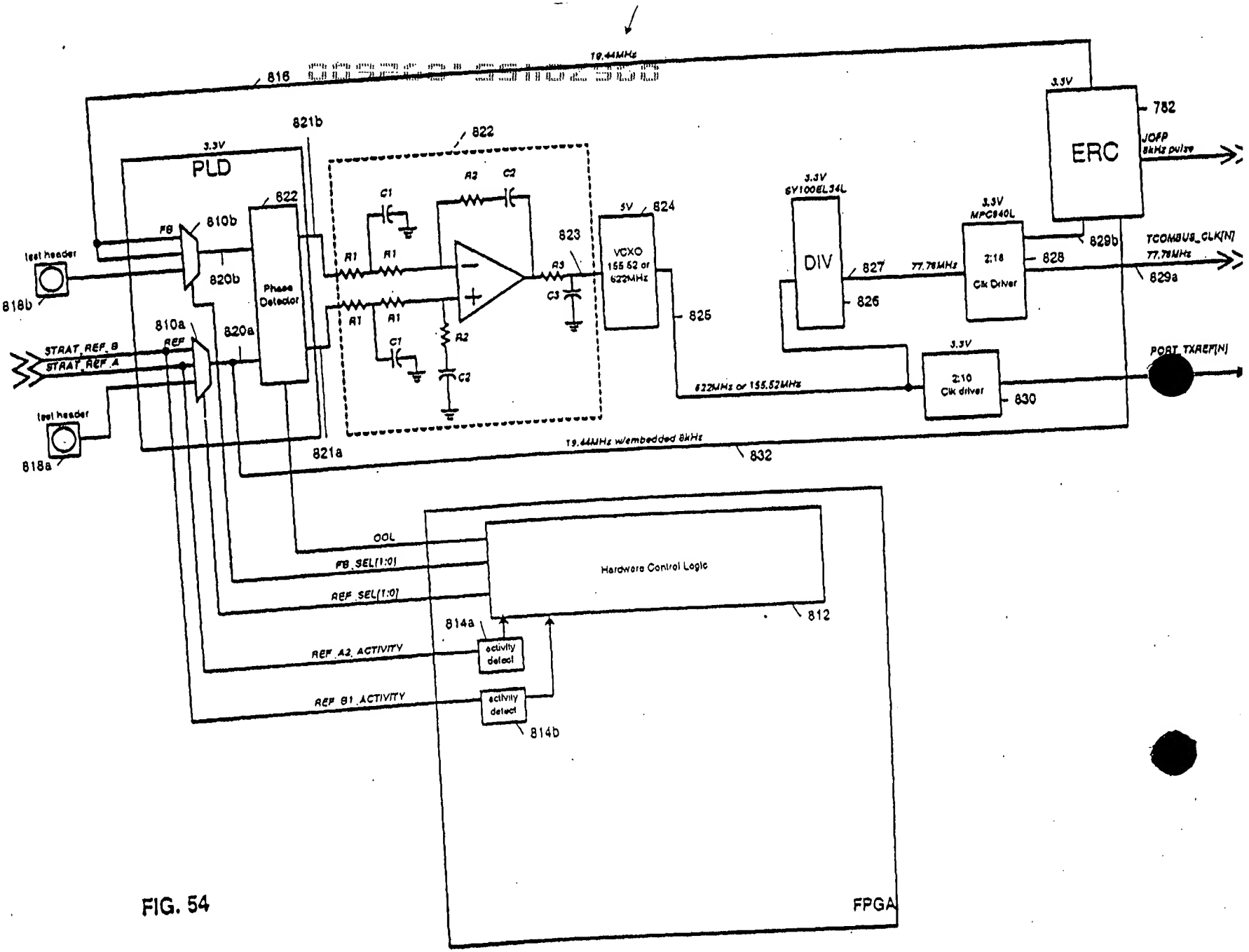

19.44MHz
816
821b
822
3.3V
PLD
FB
810b
820b
Phase Detector
test header
818b
STRAT_REF_B
STRAT_REF_A
test header
818a
810a
REF
820a
821a
C1
R2
C2
R1
R3
C3
5V
824
VCXO
155.52 or 622MHz
825
3.3V
SY100EL34L
DIV
827
826
77.76MHz
3.3V
MPC940L
2:18
Clk Driver
828
829b
829a
TCOMBUS_CLK[N]
77.76MHz
3.3V
ERC
782
JOFP
8kHz pulse
622MHz or 155.52MHz
3.3V
2:10
Clk driver
830
PORT_TXREF[N]
19.44MHz w/embedded 8kHz
832
OOL
FB_SEL[1:0]
REF_SEL[1:0]
Hardware Control Logic
812
814a
activity detect
REF_A2_ACTIVITY
REF_B1_ACTIVITY
activity detect
814b
FPGA

FIG. 54

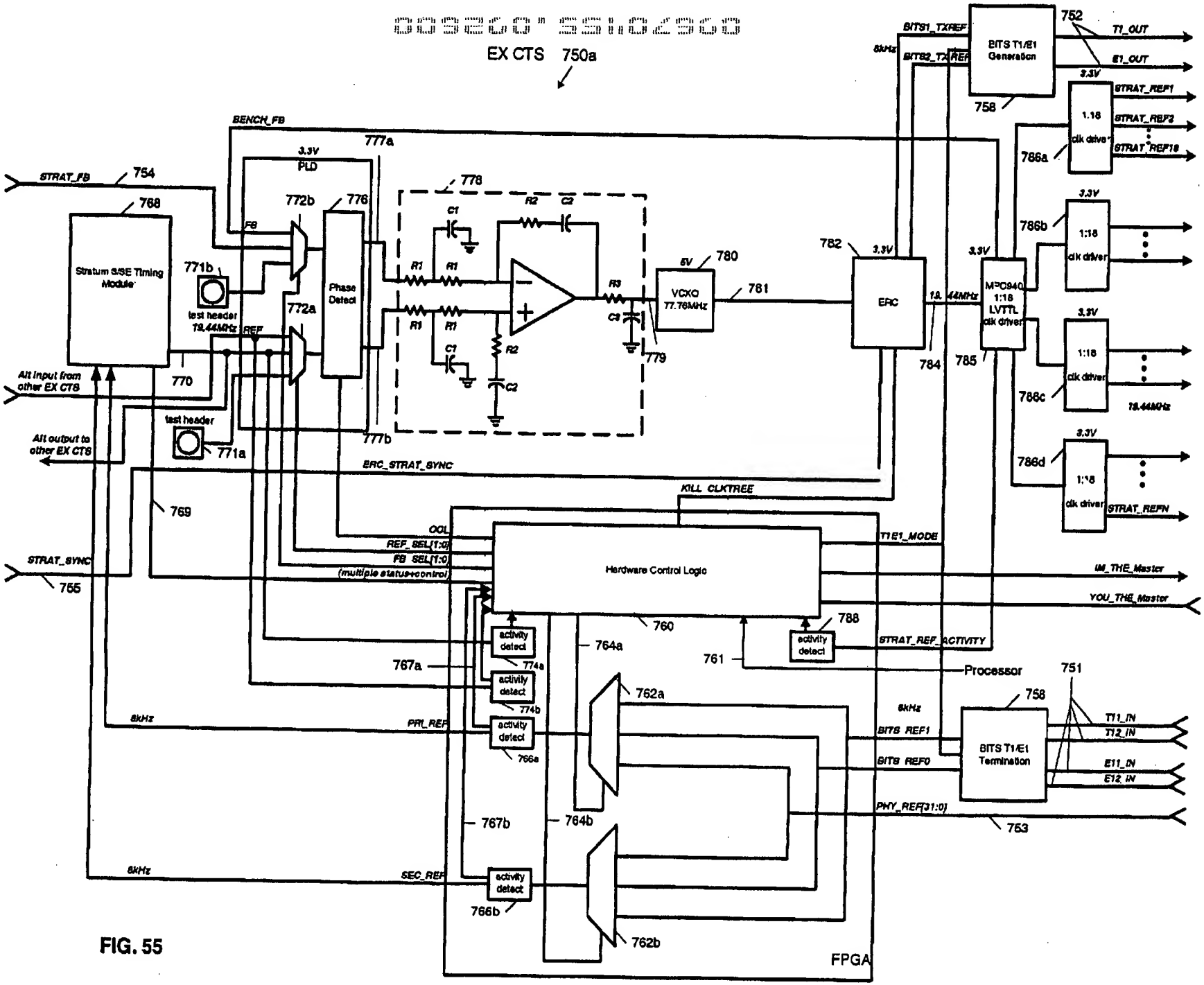

EX CTS 750a
BENCH_FB
STRAT_FB
754
768
Stratum 3/3E Timing Module
771b
test header
19.44MHz REF
Alt input from other EX CTS
770
Alt output to other EX CTS
test header
771a
769
STRAT_SYNC
755
3.3V PLD
777a
772b
772a
776
Phase Detect
777b
778
C1
R1
R2
C2
R3
C3
779
5V
780
VCXO 77.76MHz
781
782
3.3V
ERC
784
19.44MHz
785
ERC_STRAT_SYNC
KILL_CLKTREE
OOL
REF_SEL[1:0]
FB_SEL[1:0]
(multiple status+control)
Hardware Control Logic
760
T1E1_MODE
IM_THE_Master
YOU_THE_Master
STRAT_REF_ACTIVITY
761
788
activity detect
774a
774b
766a
766b
764a
764b
767a
767b
8kHz
PRI_REF
SEC_REF
762a
762b
FPGA
Processor
751
758
BITS T1/E1 Termination
BITS1_TXREF
BITS2_TXREF
BITS T1/E1 Generation
752
T1_OUT
E1_OUT
1:18 clk driver
STRAT_REF1
STRAT_REF2
STRAT_REF18
786a
786b
786c
786d
MPC940 1:18 LVTTL clk driver
STRAT_REFN
BITS REF1
BITS REF0
T11_IN
T12_IN
E11_IN
E12_IN
PHY_REF[1:0]
753

FIG. 55

548a
Forwarding Card
582a
582n
562a
Cross-Connect Card
563
554a
Port Card
573
571a
571b
571c
576a
576b
840

Fig. 56

542
Processor
599
PPM
Configure DB
PP
603
SET
76
Test Path Table
841
42
40
61
DB
NMS
60
NMS
62
546a
Forwarding Card
961
SEM
562a
Cross-Connection Card
601
Conn Pr Table
605
CCM
TSE
563
554a
Universal Port Card
597
Path Manager
21
Persistent Storage
540

FIG.57

FIG. 58

Test Path Table 841

	Path LID	UP Port LID	Time Slot	# of Time Slots	Monitor (844)	Enable Port Receiver (845)	...
842	1666	1232	4	3	Ingress	No	
843	1666	1233	4	3	Egress	No	
844	1666	1233	4	3	Ingress	Yes	
	⋮	⋮	⋮	⋮			⋮

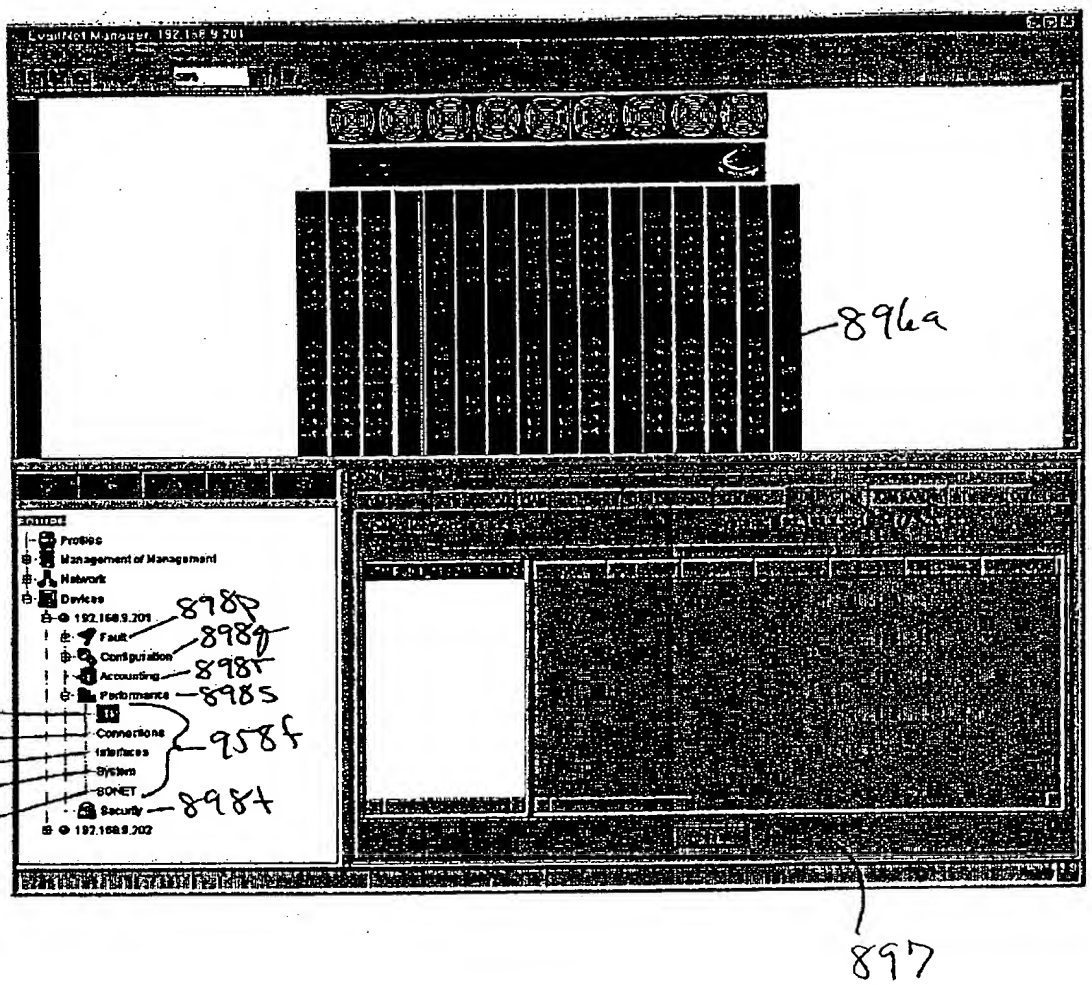

895
896a
Probes
Management of Management
Network
Devices
192.168.9.201
Fault
Configuration
Accounting
Performance
IP
Connections
Interfaces
System
SONET
Security
192.168.9.202
898p
898q
898r
898s
898t
898u
958f
958g
958h
958i
958j
958k
897

Fig. 7t